THE IRON AGE

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Open-Hearth Furnace of Large Capacity

Compact Checker and Flue Arrangement Heavy Construction and Deep Bath of New 150-Ton Stationary Unit of Central Iron & Steel Co.

THE Central Iron & Steel Company was formed in 1897 by the consolidation of the Central Iron Works and the Paxton Rolling Mills. At this time the plant consisted of three sheared mills and a 42-inch universal mill to which a flanging plant was added shortly thereafter. The Paxton furnaces were acquired by the new company in 1902 and an open-hearth plant of four 50-ton furnaces was completed in 1904. Ore mines in the Mesaba range and coal mines in the Connellsville district were also purchased.

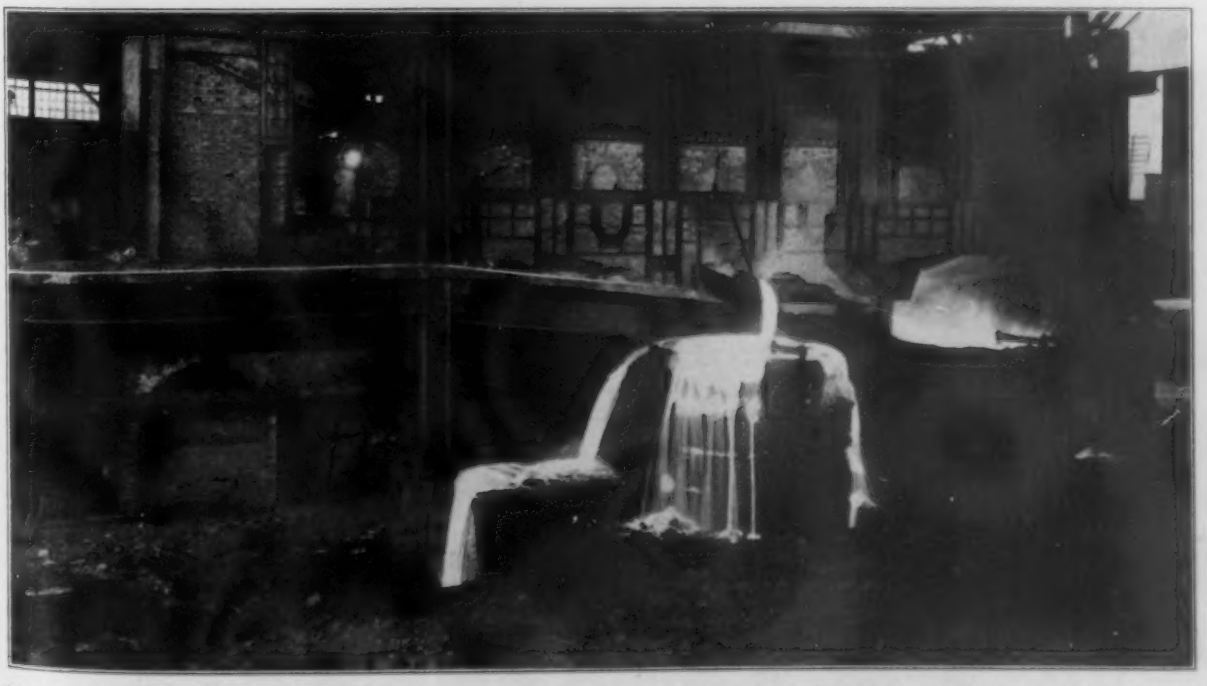
In 1915 a careful study of conditions was made to ascertain what was necessary to balance the plant and secure the maximum output. It was found that, while the capacity of the mills greatly exceeded that of the open-hearth, certain more or less radical improvements to the former would bring their capacity to almost 100 per cent in excess of the latter.

Such being the case, a vigorous policy leading to open-hearth extension was at once undertaken. After long and thorough investigation as to the most economical and efficient means of increasing the output it was decided to build a 150-ton furnace, delivering steel to two ladles by means of a forked runner. The reason for the two-ladle feature was that such could be handled by the present crane and building equipment whereas a single ladle containing a 150-ton heat would call for enormously heavier handling facilities. With this program in view a Morgan 150-ton ladle crane was installed early in 1916.

After the preliminary work had been completed, orders were given Oct. 25, 1916, to proceed with the installation of the new furnace and rush it to completion. Construction forces were promptly organized and work started on a large scale Nov. 1, 1916. The furnace was completed and turned over to the operating department on April 27, 1917. Plenty of time was allowed for the thorough heating of the furnace and for making bottom. The first heat was tapped successfully on May 17.

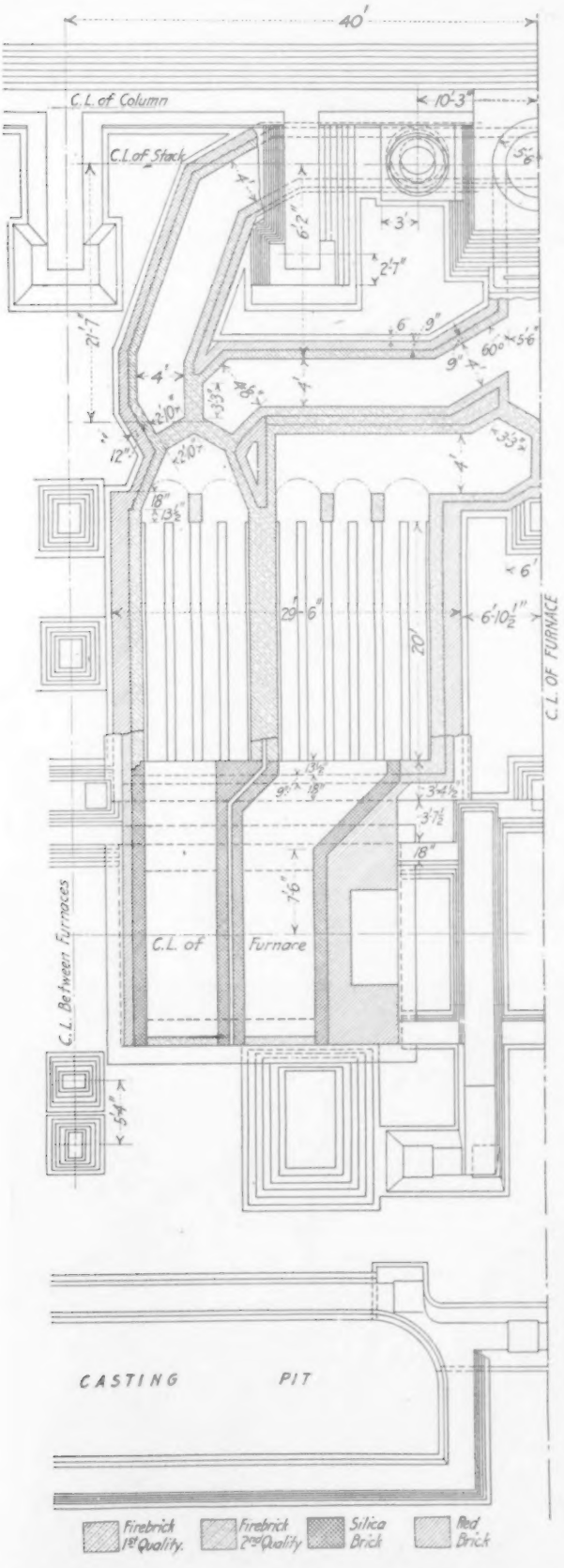
The furnace, which was designed and built by the company's employees, presents some features of particular interest, notably the heavy construction, the great depth of the bath, the long ports, the small gas port areas, and the small checker volume per ton capacity. The buildings, the refractories, the reversing valves, the water-cooled doors and frames and the electric hoists were furnished by outside companies. Practically all other materials were manufactured in the shops and mills of the Central Iron & Steel Company.

The open-hearth building has a total width of



How the 150 Tons of Steel Is Handled As It Runs from the New Furnace of the Central Iron & Steel Co., Harrisburg, Pa.

147 ft. The span over the charging floor is 74 ft. A lean-to 10 ft. wide running the entire length of the building gives additional space on the charging floor and shelter for a large cellar. The casting pit has a span of 63 ft. The height from the pit floor to the lower cords of the roof trusses is 50 ft. The charging floor is 10 ft. above and the cellar floor 7 ft. below the pit floor. The old building, which is 360 ft. long, was extended 80 ft. on the charging side and 180 ft. on the casting side.



Half Plan of the Checker Chambers and Gas Flues of the 150-Ton Open-Hearth Furnace

The extra addition to the pit facilitates casting and handling of ingots, molds and slag. The gas producer house is 35 ft. wide with an overhead coal track. The coal is dumped from railroad cars into the coal bin, the bottom of which is level with the producer tops. The old producer house is 304 ft. long. It was extended 96 ft. to give room for the five 9-ft. producers serving the new furnace.

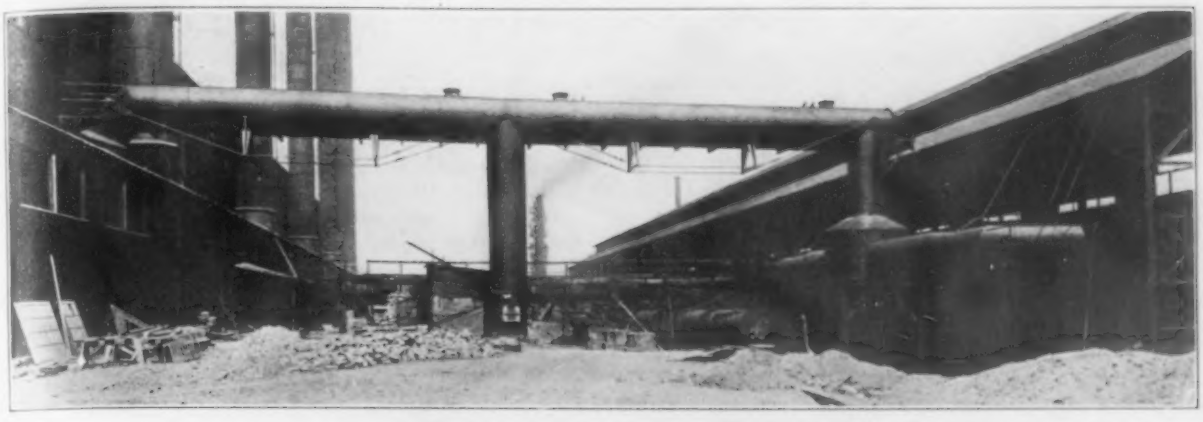
The furnace proper is 65 ft. long by 18 ft. wide inside of the binding. The hearth is 41 ft. long by 15 ft. wide. The checker chambers are located to the rear underneath the charging floor. The gas chambers are 20 ft. long, 9 ft. wide and 18 ft. deep from the skew of the arch. The air chambers are 20 ft. long, 13 ft. wide and 18 ft. deep from the skew of the arch. The checkers proper occupy a space of 2120 cu. ft. in the gas chambers and 3060 cu. ft. in the air chambers. The gas uptakes are 30 x 60 in. Two uptakes, each 38½ x 39 in., furnish the air at either end of the furnace. The gas ports are 30 in. wide, of semicircular shape. The gas port area is 425 sq. in. The air ports are 9 ft. 6 in. wide by 22 in. high, making the air port area 2500 sq. in.

The checker chambers and the slag pockets are covered by steel plates and heavily reinforced by structural struts. The furnace binding is built up of heavy slabs and structural material, and the front and back walls of the furnace are covered by heavy castings to the height of the sill line. There are about 300 tons of steel in the binding of the furnace proper. The Knox cooling system is used except for the ports which are of the company's design. The five furnace doors are lifted by Shepard electric hoists which are mounted between the building columns above the overhead crane runway on the casting side of the furnace. The controllers for these hoists are located next to the lean-to on the opposite side of the charging floor.

The fork runner is handled by a 5-ton Shepard hoist with remote control traveling on a runway underneath the crane girders. To insure the right quantity of steel to each of the two ladles a special flow control device is provided. This consists of an arm projecting from the furnace to the bifurcation of the runner. The arm is secured to a horizontal shaft carried by the furnace binding and actuated by two hand levers. A special brick is fitted over the end of the arm which is movable sideways and up or down by the hand levers under the control of one man. The flow of steel in the forks of the runner is regulated by the position of this brick which is introduced as a resistance to the flow in the one or the other fork.

The producers are hand-poked. This type of producer was adopted after lengthy deliberation as best suited to present conditions and constituting a less formidable obstacle to contemplated future developments than an expensive mechanical producer installation. In this connection it might be well to mention that a central powdered coal installation for the heating furnaces in the plant is under consideration and that it appears entirely feasible to substitute powdered coal firing also in the open-hearth furnaces.

The producers are connected to the open-hearth by overhead gas mains elevated high enough to permit of train movements in the yard between the producer house and the open hearth. A soot catcher provided in the gas main close to the producer house and a great number of cleaning doors facilitates the burning out and removal of soot. Sliding dampers are provided in the uptakes from the producers for disconnecting the individual producers from the mains.



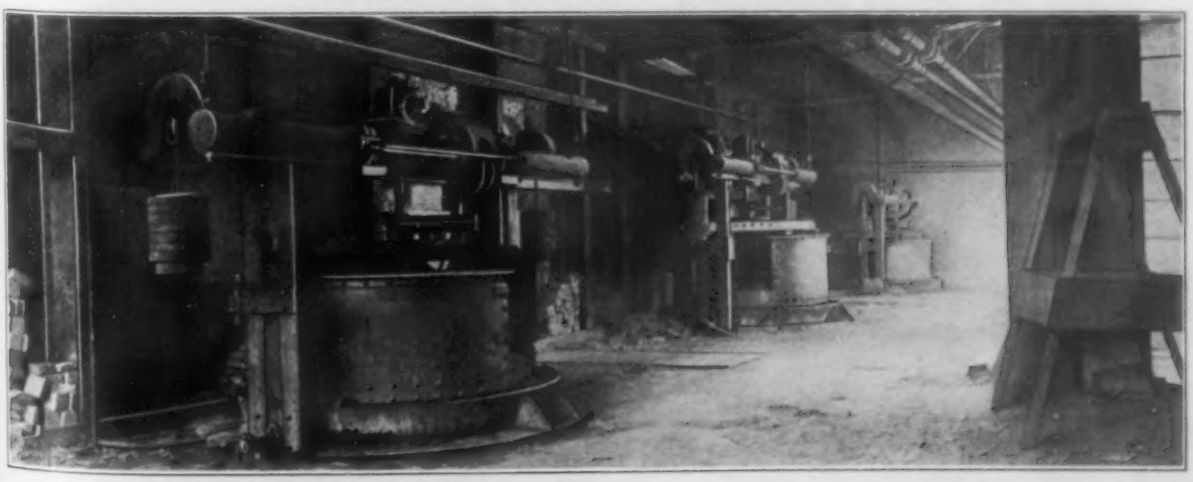
The Dust Catcher in the Overhead Gas Main Which Delivers Gas from the Producers to the 150-Ton Furnace, the Upper Portion of Which Is Shown

All flues in the open-hearth cellar are completely underground. They are short and direct and arranged symmetrically about a center line through the furnace and the stack. On one side of the stack the incoming gas is admitted through a down-comer from the overhead main to a flue passing underneath the stack and feeding the furnace. On the opposite side of the stack the burn-out is located connecting this same flue to the stack. A mushroom valve is used to regulate the incoming gas. The burn-out is served by a sliding valve. The reversing valve equipment consists of three Dyblies furnished by the Morgan Construction Co. The two gas valves are situated directly outside the checker chambers. The air valve is located in line with the gas valves and on the center line of the furnace. The valves being close to the checker chambers the gas losses during reversals are reduced to a minimum. This arrangement also allows ample room for future installation of transportation facilities in the cellar, such as a narrow-gage track system or an overhead runway. Room has also been preserved for installation of waste heat boilers and the whole design of the flues is made with a view to its being readily duplicated on the old furnaces should this prove desirable. The stack is 5 ft. 6 in. in diameter inside of lining and 150 ft. high.

Improvements are being made to facilitate the work in the casting pit. Whereas old practice has been to cast ingots in pits, pouring platforms have been provided for the new furnace to allow casting on floor level. Eventually all pits will be done away with and pouring platforms will be installed for all furnaces.

The slag is collected in specially designed boxes into which it overflows from the ladles when the heat is tapped. The filled boxes are placed on flat cars for transportation to the dump. The boxes are dumped by a 30-ton locomotive crane with the aid of a special sling fitting over trunnions provided on the boxes. The flat cars used for transportation of slag and ingots are made by the company. They are built for durability and have proved very satisfactory in service.

Cranes will be added to facilitate handling in the open-hearth depart-



The Upper Picture Shows the Ladles in Position for Tapping Under the Bifurcated Spout. Part of the operating rig is discernible. In the lower picture the three reversing valves and the heavy checker chamber binding are shown

ment. The present crane equipment consists of one 5-ton Alliance gantry crane in the scrap yard, two Wellman-Seaver-Morgan floor type charging machines, one 40-ton Wellman-Seaver-Morgan crane over the charging floor and a 150-ton Morgan ladle crane, one 100-ton Wellman-Seaver-Morgan ladle crane and three 10-ton Alliance cranes over the pit. A 5-ton gantry crane will be added in the scrap yard, a 5-ton Wellman-Seaver-Morgan charging machine on the floor and a 25-ton Alliance crane over the casting pit.

Transportation is receiving considerable attention. At the present time the open-hearth is accessible by rail at one end only by an inadequate number of tracks. A system of laterals running into the building from a broad-gage track which now parallels the open-hearth pit will eliminate congestion of traffic on the casting side of the building.

On the charging side the installation of the new furnace has made it impracticable to bring in all the charges for the furnaces at one end of the building. To overcome this difficulty, a space about 90 ft. wide between the gas producer house and the open-hearth building will be utilized as a stock yard with track connections to the charging floor at either end of the building. With this improvement carried out, several complete furnace charges can be stored in the yard and furnaces at both ends of the building can be charged independently of each other. The overhead gas mains from the producer house to the old furnaces are too close to the ground and are now being elevated to obtain the necessary train clearance under the pipes.

The intention is later to enlarge the open-hearth track system by bridging a creek at the south end of the plant and so make the open-hearth accessible by rail at either end. A coal storage located in the path of this improvement is now being moved to the north end of the plant which will also make room for a contemplated sixth furnace.

New auxiliary shops and brick storage houses are being built to accommodate the open-hearth. The old buildings are inadequate and in the way of improvements. The increased demand for electricity, chiefly by the open-hearth department, has made it necessary to install an additional rotary converter. The old substation being too small, a new substation has been built to house the two old units and a new 500 kw. General Electric rotary convertor. The new substation is a brick building, fireproofed throughout.

A production of 4000 tons of ingots per month is expected of the new furnace, using a low grade of cold stock and no hot metal. The old furnaces, under similar conditions, are producing at the rate of 10,000 tons of ingots per month. All ingots are bottom cast. While the new furnace has decidedly increased the output of steel, the mills are still capable of handling a much larger tonnage, as explained above, and the addition of another furnace and the reconstruction of the old furnaces for greater capacity is merely a question of time. In connection with this reconstruction it should be pointed out that the original checker chamber and binding are duplicated in the new furnace and would therefore remain intact. The conversion from 50 to 150-ton rating would involve merely the furnace proper (above floor level) with the slag pockets and the uptakes.

In the meantime, the other departments of Central Iron & Steel Company are being given a thorough overhauling and several improvements of considerable magnitude have recently been completed or are now being installed.

MORE CONTRACTS AWARDED

Additions Make Total of 138 Ships and Hulls Which Have Been Ordered

WASHINGTON, June 19.—The United States Shipping Board Emergency Fleet Corporation announces that during the week ending June 18 it has executed the following contracts for the construction of merchant vessels:

Seattle Construction & Dry Dock Co., Seattle, Wash.: 10 steel cargo-carrying steamers complete; first and second steamers to be delivered in June, 1918; third in July, 1918; fourth and fifth in August, 1918; sixth in September, 1918; seventh and eighth in October, 1918; ninth in November, 1918; tenth in December, 1918.

The Foundation Co., Woolworth Building, New York. Works, Newark, N. J.: 10 wooden hulls. First hull to be delivered March 1, 1918; the remaining hulls to be delivered one every 15 days thereafter, so that the last hull will be delivered on or before August 15, 1918.

Groton Iron Works, 50 Broad Street, New York. Works, Noank, Conn.: 12 wooden hulls. First hull to be delivered five months after receipt of lumber for keels; remainder average of one hull every two weeks thereafter, but all by Sept. 15, 1918.

Ship Construction & Trading Co., 50 Broadway, New York. Works, Stonington, Conn.: two wooden hulls. First hull to be delivered on or before Feb. 12, 1918; second on or before March 12, 1918.

General Goethals authorizes the publication of the following summary of the contracts heretofore let for the construction of merchant vessels for the Emergency Fleet Corporation:

Merrill-Stevens Co., Jacksonville, Fla.: 12 composite steamers complete and four all steel ships complete.

Los Angeles Shipbuilding & Dry Dock Co., Long Beach, Cal.: eight all steel ships complete.

G. M. Standifer Construction Corporation, Portland, Ore.: 10 wooden steamers complete.

Peninsular Shipbuilding Co., Portland, Ore.: four wooden vessels complete.

Sloan Shipyards Corporation, Seattle, Wash.: 16 wooden steamers complete.

Grays Harbor Motor Ship Corporation, Aberdeen, Wash.: four wooden hulls.

Coast Shipbuilding Co., Portland, Ore.: four wooden hulls.

Edward F. Terry and Henry L. Brittain, Moss Point, Miss.: 20 composite steamers complete.

Skinner & Eddy Corporation, Seattle, Wash: six steel steamers complete.

Sanderson & Porter, New York (Yard at Willets Harbor): 10 wooden hulls.

Maryland Shipbuilding Co., Baltimore (Yard at Sollars Point, Md.): six wooden hulls.

Summary—to date: Total number of contracts executed, 16; complete steel ships, 28; complete composite ships, 32; complete wooden ships, 30; total complete ships, 90; wooden hulls, 48; total number of ships and hulls contracted for, 138. W. L. C.

Old Material Men Meet

At a meeting of the Western Division of the National Association of Waste Material Dealers held at Chicago, June 12, a number of scrap iron and steel dealers were guests and were invited to join the association. The iron and steel scrap dealers took the matter under advisement, a decision to be reached after a meeting is held. It is understood that many of them are of the opinion that their interests lie more with the Board of Scrap Iron Dealers recently organized at Pittsburgh. It is recognized that the purpose of the latter organization is to assist the Government during the war and that its life may not be permanent.

The evolution of the steam turbine in the textile industry, with special reference to mechanical drives through reduction gears and the economies of large units, was discussed in a paper read recently before the National Association of Cotton Manufacturers by John A. Stevens, 8 Merrimack Street, Lowell, Mass. It is probable that a reprint of the paper may be obtained by writing to the author.

RUSTPROOFING BUMPER BARS

The Lohmann Process Applied to Automobile Parts at the Grossman Plant

THE Emil Grossman Mfg. Corporation, Brooklyn, N. Y., has recently installed a Lohmannizing department for finishing steel bumper bars, nuts, bolts and other automobile accessory parts to protect them against rust. The process, the application of which to sheet metal was described in THE IRON AGE, March 14, 1912, is named after the inventor and is designed to give a non-porous protective coating to the parts thus treated. The essential feature of the process is what is known as the Lohmann bath containing an amalgamating salt and later an immersion in a molten alloy.

The plant is housed in a two-story brick building, providing approximately 10,000 sq. ft. of floor space. The raw material, which consists of the steel bars for the bumpers, is brought to the plant direct from the freight yard by motor trucks. A 1½-ton electric hoist is employed for unloading the trucks, the material going either to the Lohmannizing department, which occupies one-half of the first floor, or to the reserve stockroom on the second floor where 4000 sq. ft. of space is available. The floor of this room has been cut away at one corner so that the trucks can be run into the building and the stock unloaded. If the bars are to go directly to the Lohmannizing department the hoist delivers them at a point adjacent to the first of the five tanks employed in the process. The hoist is also utilized for delivering stock from the reserve supply on the second floor to the Lohmannizing department.

The bars which, of course, are delivered bent to the proper form, are first dipped in a tank containing a dilute caustic solution to cleanse them of dirt, oil and other impurities. The next step is to immerse the bars in the pickle tank which contains a weak solution of hydrochloric and sulphuric acids. This solution is relied upon to neutralize the caustic and complete the cleaning of the bars. A small heating unit is employed to keep the caustic and pickle solutions warm and a hood over the pickle tank serves to carry off the fumes. The final step in the preliminary process is the washing of the bars with water to remove any acid. The bars are then placed on the set of skids near the Lohmann metal tank.

The bars are next immersed in a tank containing an amalgamating salt which is deposited in metallic form upon the entire surface and penetrates the cavities, thus giving a surface to which the molten alloy in the final tank will adhere. This tank contains a mixture of molten lead, tin and antimony, which is maintained at a temperature of 650 deg. Fahr. by a furnace underneath the tank. The tank and furnace are entirely surrounded by brickwork and are raised above the main floor. The heating of the bar when it is dipped in the alloy causes the amalgamating element to volatilize when a temperature of 500 deg. is reached. The volatilization of this salt frees the surface of the metal from all oxidizing agents and as the salt leaves each pore and cavity the protective alloy takes its place and adheres to the cleaned base surface. A large hood is provided over the metal tank to carry off the vapor rising from it.

The Bars to Be Rustproofed Are First Dipped in a Tank Containing a Dilute Caustic Solution to Remove Dirt and Impurities and Then Go Successively to the Pickle, Rinsing, and Lohmann Tanks and Finally into the Hooded Metal Tank in the Background

The Bars at the Right Have Come from the Rinsing Tank and Are Ready for Immersion in the Lohmann Metal Tank, While Those at the Left Have Passed Through the Lohmann and Molten Alloy Tanks and Have Had the Surplus Metal Removed

The parts being treated are lighter than the molten alloy and float near the surface. They are withdrawn by hooked rods and are placed on skids where men with gloved hands wipe them off with ordinary cotton waste. The surplus metal, of course, falls to the floor as can be seen in one of the accompanying illustrations. This is later swept up and remelted. A motor-driven rotary wiping machine will be installed in the near future to do this work.

The bars are placed in flat crates which measure 28 x 64 in. The crates are divided into four compartments, each of which will hold one double or three single bars. The bars are taken in the crates to the grinding room for polishing. The equipment in this department consists of 38 wheels, all of which are driven by a 50-hp. electric motor. The emery dust, metal particles and vapor are drawn to a separator by a double exhaust fan driven by a 25-hp. electric motor. The particles of metal and emery produced in the grinding operation are separated and sold, the vapor, of course, passing off to the outer air. The bars are then repacked in the crates and are sent to the main plant about half a mile away, where they are plated, buffed and assembled ready for the market. The capacity of the Lohmannizing plant is approximately 1000 bumper bars per day, in addition to mirrors, nuts and other parts which are treated by this process.

England Quits Work on Munitions Plant

Because of the entry of the United States into the war the English Government, according to cable advices, has ceased work on a big munitions plant at Bristol on which $500,000 had already been spent. More than 40 farmers had been deprived of their farms to make room for the plant, which will now be razed and the farmers will have their property and homes restored.

The Pennsylvania Engineering Works, New Castle, Pa., has declared a stock dividend of $300,000, payable July 1. The company will increase its capital stock from $600,000 to $1,000,000, $300,000 to be paid as stock dividend and $100,000 to remain in treasury.

Women are now employed in the chemical laboratory of the Algoma Steel Corporation. Two-thirds of the force of routine chemists are girls, who have shown aptitude, accuracy and notable orderliness after a short period of training.

AID FOR INDUSTRIAL TRAINING

Smith-Hughes Bill, Effective July 1, Appropriates $1,700,000 First Year, More Thereafter

Under the provisions of the Smith-Hughes bill, which becomes effective July 1, 1917, all of the States may avail themselves of Federal grants of money for the purpose of promoting schools for industrial education. The United States Government will give its aid to the extent of $1,700,000 the first year, with increasing amounts each year until the maximum under the bill, $7,200,000, is reached in 1925.

Further than to appropriate the money the Federal Government will not go. The initiative in the movement for the establishment of a thorough system of vocational schools must come from the States. Doubtless the action in each State will in turn depend very much on the initiative of manufacturers whose employment problems would be favorably affected by the education of youths in various occupations.

The National Society for the Promotion of Industrial Education, with offices at 140 West Forty-second street, New York, has made investigations in a number of cities during the past two years in which it has been found that the metal trades in particular would be greatly benefited by vocational training. Production has increased at such a rate that it has been a difficult matter for employment managers to keep the gaps in the ranks filled with workmen with any special training or fitness for the particular work required of them.

Manufacturers in the metal trades have been almost a unit in declaring that the apprentice system is a thing of the past and no longer practicable under present-day conditions. They deplore the fact that far too large a percentage of the workers are nomads—they wander from job to job, and while this is generally attributed to worthlessness or shiftlessness on the part of the workers, these same employers are willing to admit that a system of industrial education where the unfit would be eliminated in the schools instead of in the factories would greatly mitigate the employment problem and increase the efficiency of the factories.

Eight states had a system of vocational education in operation when the Smith-Hughes bill was passed last February, and it was expected that many others would take some action in order to receive the benefit of Federal aid. In fact, within three months after the passage of the bill nearly half of the states of the country had passed bills accepting the provisions of the Vocational Education Act, as the Smith-Hughes bill is now called.

Manufacturers in a great many cities have found the most practicable method of getting vocational education for their community is to take the matter up with the local board of education, with the idea of introducing such training in the high schools. An example of what has been accomplished in this way is afforded at Brdigeport, Conn., where the tremendous growth in manufacturing during the war has made the training of new workers a matter of the greatest necessity. The Standard Mfg. Co. of Bridgeport, with the permission and co-operation of the local board of education, has been conducting a course in the public schools for several years. Mechanical drawing, shop mathematics and other subjects have been taught to apprentices. Employees of the Parsons Foundry Co., also of Bridgeport, were given permission to take the same course. Sessions are held in the evenings three times a week in a public school located near the plant from which the evening students come.

Many of the schools of this kind which have been in operation have been handicapped by lack of teachers and proper equipment, but this will be partially remedied if the states or cities take advantage of the benefits of the Vocational Education Act.

At Waukesha, Wis., the Waukesha Motor Co., maker of automobiles, trucks and tractors, co-operated with the local board of education in supplying facilities for training students for its type of work. The company permitted the public school authorities to establish a school organization within its plant, open to any person over 16 years of age who qualifies. Part of each working day is devoted to actual instruction and teaching of the rudiments of gas engineering, civics and general subjects, and the remainder of the time to practical work within the factory. The company pays full wages for the time devoted to schooling and offers future employment to all who take the course. Two cents per student hour is charged by the company to the school board of Waukesha as a nominal fee.

The National Society for the Promotion of Industrial Education points out that it is by such co-operation with the school authorities on the part of manufacturers that the greatest impetus to industrial education will be given.

Export Conference at Springfield, Mass.

Important meetings in furtherance of the export trade of the United States will be held at Springfield, Mass., in the seven business days from Saturday, June 23, to Saturday, June 30, inclusive. They will constitute the conference side of the Export Conference and Industrial Trade Exposition, which has been planned by a general committee named by the executive committee of the Eastern States Exposition. The general committee is headed by Frank H. Page, president National Equipment Co. Co-operating with the committee in addition to the Department of Commerce of the United States, are the National Association of Manufacturers and banking and other organizations. Secretary William C. Redfield of the Department of Commerce will give an address on "After the War—What?" at the opening session, June 23. In the following week morning and afternoon sessions will be held daily, and on Wednesday and Friday, evening sessions in addition. Thursday is "Metals Day," Friday "Transportation Day," and Saturday "Chemical Day."

The program for the Metals session on Thursday morning, which will be presided over by Charles E. Hildreth, Worcester, Mass., general manager National Machine Tool Builders' Association, includes the following: 10 a. m., "After the War—What of Machinery Export?" Speaker to be announced. 10.30 a. m., "American Tools in Foreign Markets," by Oren O. Gallup, New York, export manager Simonds Mfg. Co., Fitchburg, Mass. 11 a. m., "Metal Fittings in Overseas Markets," by Adolph W. Gilbert, Chapman Valve Mfg. Co., Indian Orchard, Mass. Among other speakers at the various sessions are the following: William S. Kies, vice-president National City Bank, New York; F. C. Schwedtman, manager industrial bureau, National City Bank, New York; W. H. Lough, secretary Business Training Corporation, New York. Dr. E. E. Pratt, chief of the Bureau of Foreign and Domestic Commerce, will speak on "The Department of Commerce of the United States of America and its Service to American Manufacturers"; J. E. Fitzgerald, chief of Consular Division; Bureau of Foreign and Domestic Commerce, "World Trade"; Robert H. Patchin of W. R. Grace & Co., New York, "Maintaining Commerce During War"; Hon. William Denman, chairman United States Shipping Board, Washington; "The Federal Shipping Board," and J. W. Jenks, Columbia University, "The Far East."

Low-Priced Buffing and Grinding Machine

The U. S. Electrical Mfg. Co., Los Angeles, Cal., has developed a motor driven grinding and buffing machine for bench or pedestal mounting. It is the two wheel type and is equipped with ball bearings inclosed in a special housing with sealings rings to guard against the entrance of dirt and grit. The tool grinding rests provided are adjustable in all directions and the water pot can be swung out of the way easily. The wheels are protected by heavy iron guards and the motor, which can be wound for either single, two or three phase alternating current, is entirely inclosed.

Messer & Co., manufacturers of welding and cutting apparatus, 117 North Seventh Street, Philadelphia, have changed their corporate name to the Messer Mfg. Co.

Manufacturers' Selling Company Locates in New York

The International Manufacturers' Sales Co. of America, which has been in existence about 18 months, with offices in Chicago, and which is the selling organization for a considerable number of non-competing manufacturers, who are stockholders in the sales company, has taken the fiftieth floor of the Woolworth Building, 233 Broadway, New York, for its executive offices. Its export business appears to be confined to Russia with the main sales office at Bolshaia Lubianka 6, Moscow, but it also has offices at Petrograd, Kiev, Odessa and Kharkov. Among the board of directors are L. H. Treadway, president Peck, Stow & Wilcox Co., Cleveland; B. T. Leuzarder, treasurer Chicago Belting Co., who is also treasurer of the Sales Co.; L. N. Burns, secretary J. I. Case Plow Works, Racine, Wis., who is also secretary of the company, and W. O. Washburn, American Hoist & Derrick Co., St. Paul. A. S. Postnikoff is president and general manager and R. H. Morris, assistant secretary.

Among the companies which are stockholders may also be mentioned: J. D. Adams & Co., road building machinery, Indianapolis; American Steam Gauge & Valve Mfg. Co., Boston; Ames Shovel & Tool Co., Boston; Avery Co., gasoline engines and tractors, Peoria; Burroughs Adding Machine Co., Detroit; Cadillac Motor Car Co., Detroit; J. G. Cherry Co., dairy machinery, Cedar Rapids, Iowa; Chicago Bridge & Iron Works, Chicago; Diamond Chain & Mfg. Co., Indianapolis; Elyria Iron & Steel Co., Cleveland; Hart Mfg. Co., die stocks, Cleveland; Jeffrey Mfg. Co., Columbus; Kelly Axe Mfg. Co., Charleston, W. Va.; Koehring Machine Co., concrete mixers, Milwaukee; A. Y. McDonald Mfg. Co., pumps, Dubuque, Iowa; New York Rubber Co., New York; Quaker Mfg. Co., stoves, furnaces, etc., Chicago; Saxon Motor Car Co., Detroit; Scovill Mfg. Co., brass specialties, Waterbury, Conn.; Twentieth Century Machinery Co., canning machinery, Milwaukee; Upson Nut Co., Cleveland, and White Sewing Machine Co., Cleveland.

The Country's Tungsten Resources

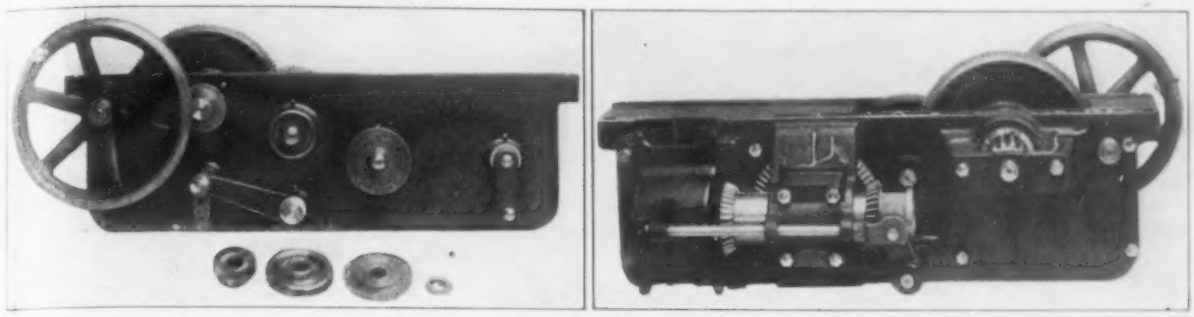
In order to answer the questions daily coming to it regarding tungsten minerals and the uses of the metal, the U. S. Geological Survey has issued Bulletin 652, entitled "Tungsten Minerals and Deposits," by Frank L. Hess. It covers the field admirably and is illustrated by some striking colored photographs of tungsten minerals. The general facts about tungsten are covered—the minerals in which it is found, the kinds of deposits from which these minerals have been obtained, and the like.

Island Park Furnace Bought

The Northern Ore Co., 1410 Real Estate Trust Building, Philadelphia, of which T. I. Crane is president, is a recently formed corporation which has acquired the Keystone furnace of the Thomas Iron Co., located at Island Park, Easton, Pa. The furnace has not been operated since 1911. It has a capacity of about 100 tons a day. The new owners will put it in blast as soon as repairs can be completed. It has not yet been decided what the product will be.

New Apron for Heavy Duty Lathes

The Houston, Stanwood & Gamble Co., Cincinnati, whose plant is across the Ohio River in Covington, Ky., is fitting up all of its heavy duty engine lathes running from 30 to 60 in. in size with a new type of apron, which has a number of distinctive features. It was designed by W. L. Schellenback, a Cincinnati consulting engineer, who departed from the usual custom of using a friction clutch and substituted a positive toothed clutch. The manufacturer claims the superiority of a positive clutch lies in the fact that it will not slip, and also because of the slight pressure required to hold the clutch closed, it is very easily and quickly released.



A Positive Toothed Clutch and a Broad Face Coarse Pitch Rack Pinion Characterize a Recently Designed Apron for 30 to 60 In. Heavy Duty Lathes

The disks in the initial drive are connected by a shearing pin, which is intended to protect the feed mechanism from breakage should the carriage be accidentally fed against the tail or head stocks or the steady rest. It will also be noticed from the illustrations that the rack pinion can be withdrawn from engagement with the rack for thread cutting. The nut for the lead screw is opened and closed in the usual manner and the customary reverse lever is provided for shifting the double bevel gears. The positive tooth clutch for cross feed is attached to the carriage, but not shown. Attention is called to the reduction from the handwheel to the gear in the lathe, thus insuring easy movement of the carriage by hand.

The back of the apron is shown, and attention is called to the broad face coarse pitch rack pinion. An outer bearing is provided for the rack pinion so that it does not overhang, as is usual in lathes of this kind. The large bevel gear also has an outer bearing, although this is not shown. A double plate is used, thus giving a support at both ends of all shafts. The method of lubrication is further claimed to be out of the ordinary, as a capillary wick is employed for oiling the bearings in the rear plate of the apron.

All gears are of steel and have very broad faces, so as to enable the taking of extra heavy cuts without danger of stripping.

Canada Places 50,000 Tons of Rails

The Imperial Munitions Board of Canada has confirmed the published statement that it has authorized the Algoma Steel Corporation and the Dominion Iron & Steel Co. to roll 50,000 tons of standard section rails. The board does not state what is to be done with these rails but it is believed they will be distributed among Canadian railroads which helped the Dominion Government last year by taking up rails which were in track and shipping them across the Atlantic for use in the war zone. These roads were unable to secure new rails from mills in the United States. It is stated the 50,000 tons will be distributed among the Canadian Pacific, the Grand Trunk, the Temiskaming & Northern Ontario and the Government railroads.

The Henry Vogt Machine Co., Louisville, Ky., has given its employees an increase of 10 per cent in wages. This is in addition to previous advances and applies to 700 men.

Drop Forging Problems Discussed

Meeting Last Week in Cleveland of American Drop Forge Association—Commercial as Well as Technical Matters Considered

VARIOUS steps to increase the efficiency of the American Drop Forge Association were taken at the annual meeting held in Cleveland, at the Statler Hotel, June 14, 15 and 16. The association has enjoyed rapid growth during the year and now has in its membership over one-half the drop forge plants in the country and companies operating more than three-fourths of the hammer capacity. Its membership includes both jobbing forge shops and companies manufacturing forged articles for their own use. The Drop Forge Supply Association formed by the supply houses at the Philadelphia convention a year ago completed its organization by adopting a constitution and electing a complete set of officers, and is now established on a firm basis, with promises of increased growth. The attendance was very gratifying, there being a total registration, including the ladies, of 211. Of these 105 were forge men and 61 were supply men.

In its business session the association showed its spirit of patriotism by adopting a ringing resolution supporting the administration for entering the European war, and offering to place the forging plants at the disposal of the Government during the period of the war. The importance of the drop forge industry in supplying government requirements for war purposes was referred to. To make the association of more value to the members it was determined to provide closer co-operation between meetings and more frequent meetings of the directors. As a part of its program of enlarged activities the dues were increased.

Standard Code for Bidding

One of the most important moves taken was the decision to provide a standard code for forge shops. This is to be prepared by a committee, and when adopted, members will be in a position to make bids for work on standard specifications, and much of the irregularity in bidding, due to absence of such specifications, will, it is believed, be eliminated.

Technical sessions were held on Thursday afternoon and Friday morning and afternoon. Papers presented related to forge shop methods and practices, management, production, standardization, bonus systems, safety devices and other topics.

The convention was opened with an address of welcome by Harry L. Davis, Mayor of Cleveland, and the key to the city he presented was a real key of very large size.

The Competition After the War

The address in behalf of the drop forge men of Cleveland was made by Charles E. Adams, president Cleveland Hardware Co., who sounded a note of warning as to the conditions when the war is over. When all plants are endeavoring to get production it is the time for manufacturers, with a view to the future, he said, to work out the best and most economical way of doing things. He predicted that manufacturers will face the same conditions as existed before the war, and possibly worse conditions. He spoke of being offered $38 per ton for steel scrap that he had formerly sold as low as $8 and said that he would not be surprised to see the price drop back as low as $7 a ton. At present about 15,000,000 men are engaged in the war and much of their work at home is being done by women and boys. These 15,000,000 men will be looking for jobs as soon as the war is over. Manufacturers should plan economical ways of doing things by cheapening labor, not by paying labor less per hour, but by getting from one man and the machinery as much output as two or three men are turning out now. He did not believe in placing a stone wall around a manufacturing plant so that competitors could not ascertain how work is being done and announced that his plant is open to the inspection of everybody interested.

R. T. Herdegen, Dominion Forge & Stamping Co., Walkerville, Ont., president of the association, in his address referred to war conditions and war contracts. He said that Canadian manufacturers are not deluding themselves into believing that a high tariff wall will stay up forever, and plants must be equipped to meet conditions when this wall comes down. The United States faces the same situation. Under present inflated prices and production conditions manufacturers are inclined to get careless in respect to plant management. They should go over their plants and study such subjects as the power, motors, conservation of die blocks, and they should know costs and be careful about scrap. In other words, the manufacturer should know if his plant is efficient. He should get as many ideas as possible from the papers read at the meetings because conditions may be entirely different a year from now.

Taking War Business

In regard to war business, he stated that if forge shops are asked by the Government to do work, they will take this business from a standpoint of patriotism whether they want it or not. Many have volunteered the use of their plants for Government purposes, and while their offers have not yet been accepted they may be called upon to do Government work. A plant having war business generally was granted certain privileges that it did not have before. At least, that is true in Canada. He warned his audience, however, that if they took war contracts they should be sure to know what they are taking. The Government is easy when it starts out and the manufacturer is told that this or that specification may be overlooked. However, he declared that after a plant has been turning out the product a short time the Government becomes strict and every clause of the specifications is lived up to finally. On that account specifications should be thoroughly understood before an order is taken.

Mr. Herdegen stated that the association has never been so prosperous as at present, and that probably over one-half of all the drop forge plants in the country are now enrolled as members and that from the standpoint of hammer capacity, over 75 per cent of the industry is in the association. In this connection, E. B. Horne, Packard Motor Car Co., Detroit, secretary and treasurer, in his annual report, which was presented next, said that the association has now an active membership of 83, an increase of about one every two weeks of the year, and of this total, 27 have in their plants 888 hammers, these representing about 75 per cent of the hammer capacity of the country.

Next Year's Officers

The meeting closed Friday afternoon with a business session and the election of the following officers for the ensuing year:

President, Robert T. Herdegen, Dominion Forging & Stamping Co., Walkerville, Ont. (re-elected).

Vice-president, S. H. Carpenter, Atlas Drop Forge Co., Lansing, Mich.

Secretary and treasurer, E. B. Horne, Packard Motor Car Co., Detroit (re-elected).

Directors: T. W. Siemon, Union Switch & Signal Co., Pittsburgh, chairman of the board; George Desautels, Imperial Drop Forge Co., Indianapolis (re-elected); J. F. Zwicker, Willys-Overland Co., Toledo, Ohio (re-elected); E. J. Frost, Frost Gear & Forge Co., Jackson, Mich. (re-elected); F. A. Ingalls, Ingalls-Shepard Forge Co., Harvey, Ill. (re-elected), and J. F. Connelly, Champion Machine & Forging Co., Cleveland.

It was decided to raise the dues from $10 to $25 a year. For the next place of meeting, to be decided by ballot among the members, Atlantic City and Detroit are being considered, with the former apparently in the lead.

The committee to which had previously been referred a resolution to increase the membership of the Board of Directors, reported in favor of enlarging the board from 8 to 12 members. The purpose of providing a larger board is to enable the directors to hold more frequent meetings and to have large enough membership to transact business should a few of the directors be unable to attend. However, in view of the present unsettled situation the association decided to postpone action until next year.

Drop Forge Supply Association

The Drop Forge Supply Association, formed at the Philadelphia meeting a year ago, completed its organization by adopting a constitution and by-laws and electing officers. The question of making exhibits at the annual meeting of the Drop Forge Association was discussed, but the sentiment seems to be that each manufacturer should make his own arrangements, should he desire to have an exhibit. Officers elected were as follows:

President, H. N. Taylor, N. & G. Taylor Co., Philadelphia.

Vice-president, Charles Harmon, Jr., National Machinery Co., Tiffin, Ohio.

Secretary-treasurer, A. L. Wurster, Heppenstall Forge & Knife Co., Pittsburgh.

Executive Committee: H. D. Heman, Ajax Mfg. Co., Cleveland; George H. Derbyshire, Chambersburg Engineering Co., Chambersburg, Pa.

A membership committee of which Julius Diercks, Keller Mechanical Engraving Co., Brooklyn, is chairman, and an entertainment committee of which George I. Allen, Keppenstall Forge & Knife Co., Cleveland, is chairman, were named.

Use of Trade Acceptances Advocated

The first paper presented was on "Credit and Collections," by T. W. Siemon, vice-president and treasurer of Union Switch & Signal Co., Swissvale, Pa. He referred to trade acceptances as a valuable asset to a firm with a limited capital providing a simple method of doing an enlarged business with existing resources. The complete introduction of this system will eliminate some of the worst abuses of the open account system, including taking unearned discounts. In other words, time drafts drawn by the seller on the buyer at the time of sale and providing a definite payment at a definite time are substituted for the system of open book accounts.

He emphasized the need of a uniform cost system by members of the association and suggested that the members secure pamphlets on this subject from the Federal Trade Commission, Washington.

Need of Code for Forgers

The subject of standardization was brought up in a paper on "Standardization of Finish on Forgings" by E. J. Frost, Frost Gear & Forge Company, Jackson, Mich., a summary of which follows:

Few automobile engineers and draftsmen are well enough versed in the minute details of forge and machine shop practice to be able to designate on drawings many of the things which are necessary for an intelligent and satisfactory production. It is probably due largely to this lack of essential detail, that there is often such a wide divergence in prices quoted, because one estimator sees ways to cheapen his product and still comply with the blueprint requirements, while another competitor proposes to supply a better forging at a higher price. Usually the purchasing agent will select the lowest bid, ignoring the fact that possibly the highest price quoted would have saved several times the difference in the machining cost.

Forge people are facing new problems, due to the automobile industry, and the sooner they set about to correct some of the evils that have been the result of rapid development, the sooner will end the needless controversy, rupture of business relationship and financial loss. The speaker picked out some examples to illustrate how standardization could be handled and expressed the hope that a code could be formulated acceptable to all interests and placed in the hands of engineers and agents, with the understanding that when the blueprints of customers do not specify, the code will be followed. One recommendation was that practical drop forgers be called for consultation while new designs are being worked out, that at least preliminary drawings or sketches should be sent to prospective sources of supply to get constructive suggestions and avoid revising drawings and details. He knew of cases where if this policy had been followed the saving would have been enormous.

In a case of large automobile forgings, such as axles, crank and cam shafts, tolerances and amounts for finish should be established and any requirements beyond these should call for a corresponding increase in price. The recent tendency has been to compel drop forgers to produce axles of such refinement that machining costs are brought to the lowest possible amount. This would be satisfactory if the price was commensurate with the extra work. Mr. Frost held that an overall tolerance of ⅛ in. should be as close as required from king bolt to king bolt center, although some manufacturers were requiring 1/16 in. In regard to twist in an axle, some purchasers require that yokes come absolutely to gauge, but he believed this practice unfair unless an additional price is paid. Various other specific cases were referred to in which there are likely to be controversies between the drop forger and the customer in the forge practice shop, which would be eliminated were standard specifications followed. In conclusion he made the following recommendation:

1. That a committee be appointed on standardization of designs and drawings, whose duty it shall be to formulate a working code on forging practice, if possible introducing a set of symbols, to define accurately the quality of surface required and method to be employed in machining.

2. That it shall be the duty of this committee to have printed, at the expense of the association, as many copies of this code, after it has been approved by the executive committee, as may be required to send to customers.

3. That bidding be refused on blueprints which do not reasonably conform to the code.

It was suggested in the discussion that standard tolerances be provided for certain work so that different shops would not submit bids based on different tolerances. One speaker pointed out that many manufacturers are now overcoming some of the trouble referred to in Mr. Frost's paper by securing forging drawings to work on, these being furnished by the buyers. At the conclusion of the discussion a motion that the next president be instructed to appoint a committee on standards was adopted.

Safety in Forge Shops

In a paper on "Safety in the Forge Shop," J. E. Williams, Pennsylvania Forge Co., Philadelphia, said that no type of manufacturing plant requires more attention in respect to safety devices than the forge shop. Managers of forge plants owe it to themselves to install everything possible to guard their equipment. He stated that shears and presses should be carefully guarded, and, in fact, every piece of movable machinery, up to 7 ft. above the floor, should be provided with guards. Flywheels should be protected with plates, fastened to the side of the wheels. Men doing work that might lead to the injury of the eyes should wear goggles, and fire screens should be placed in front of the furnaces. He believed it is to the interest of the employer for the men to keep clean, and recommended that all shops be provided with lockers, this being more of a sanitary than a safety measure.

The paper brought out considerable interesting discussion that was started by Mr. Herdegen, who said that the speaker had sounded an important note at the present time when all manufacturers are interested in con-

serving man power. J. F. Zwicker, Willys-Overland Co., Toledo, Ohio, said that the flywheels, gears and belts in the Overland forge shop are guarded and that there is a department that devotes all of its time to looking after safety matters. Grinders are compelled to use goggles and they have tried to require die sinkers to wear them, but these attempts were unsuccessful.

There was quite a general exchange of views on placing guards on hot and cold trimming presses. Several had used guards on these presses, but generally they had found them unsatisfactory and had taken them off. James Reid said that at the Buffalo plant of J. H. Williams & Co., with which he is connected, the trimming presses are equipped with a hand treadle in place of a foot treadle, this requiring both hands to operate it. This safety device was found satisfactory and did not cut down the production. Mr. Zwicker remarked that at the Overland plant an automatic arrangement is used on the trimming presses to prevent them from repeating.

Referring to the recommendation of Mr. Williams, that flywheels on presses be covered with plates, one speaker referred to an accident caused by a flywheel that was protected in that way, and said that the entire wheel should be covered by a stationary guard. The discussion brought out the fact that at a number of forge shops committees of workmen are appointed to make suggestions as to guarding machinery, the best suggestions being carried out, and this method interests workmen in safety work and getting practical ideas on safeguards.

In his paper on "Prices with Profit," F. A. Ingalls, Ingalls-Shepard Forging Co., Harvey, Ill., said that he did not think it would be possible for drop forge men ever to make an agreement on prices, but they should develop the determination that fair prices should prevail and that a profit should be made on every transaction. Manufacturers operating drop forging departments should earn a profit on investment and cost of operation, but some of these could buy forgings cheaper than they are making them. In the discussion it was brought out that the Buick automobile forge shop, in Flint, Mich., has to meet outside price competition on forgings. Frank F. Storms, Page-Storms Forging Co., Chicopee, Mass., said that in his plant each department must carry itself and make a profit.

Planning and Scheduling Production in a Forging Shop

A PAPER by D. M. Motherwell, Western Drop Forge Co., Marion, Ind., describing the planning and scheduling of the production in his company's plant, was as follows:

It has often been said that a job well planned is half done. To get the best results out of any running plant we must plan and schedule so that each operation will dove-tail into the next, in the least possible time and with the least effort to obtain the maximum production at a minimum cost. To do this we must have a system that is simple in operation and easy to understand, one that will be not only reliable, but valuable in executing similar work in the future.

The system used by Western Drop Forge Co., Marion, Ind., is known as the production board system. We have erected a production board, properly spaced and lettered, provided with screw hooks to carry production cards, containing all the information relative to the orders; date of order, order number, part number, die number, name of part, quantity specified, customer, when wanted, size and length of stock required for the production of the part, analysis of material, and the rough and finished weight of the part. This card also shows the date of production, quantity made, and carries a balance column showing daily the net balance to be made to complete the job. This card shows at a glance a complete record of the work and from the information given we also determine the efficiency record of every job in the plant.

A Production Board Used

As soon as the work is inspected from the hammers the daily forging or inspection report is sent to the production office, and the cards are properly marked showing the quantities made opposite the date on the card, which shows total quantity made to date and the balance to make. This production board is so located that the production engineer may, in a very few minutes, check up the whole day's run.

The margin at the left end space is marked to show where the card may be placed with reference to condition of the tools, etc. First there is at the top a space marked "New Orders." All cards when made out will be placed on this line. If the tools are correct and ready to run the card will then be placed on the space marked "Jobs Working," or if the job cannot be set in the hammer right away and it is a rush job, then the card is placed on the space marked "Promise and Rush," and will go in the hammer next. Providing the tools are ready for running and no forging stock is available for the part, the card is then placed on the space marked "Waiting on Stock." If job has been running and dies give out before job is completed, the card is placed on the space marked "Dies Waiting to be Resunk and Repaired." When the die is being worked on in the die department the card is moved right along and takes a place on space marked "Dies Being Resunk and Repaired." Then when completed, the card is moved along to space marked "Leads to be O. K.'d." By this method every move throughout production is followed by the card on the production board, and at all times the board will give information relative to the standing of every job throughout the works.

The production board which we have provided is 40 in. deep and can be made long enough to accommodate any amount of machines, as this system will work equally as well for drill presses as it does for steam hammer work.

We have provided on the top margin spaces giving size, kind and weight of hammer or name of machine. When an order is received a card is made out and assigned to hammer or equipment in which the particular order is scheduled to operate, and this card is then placed in proper space on production board. For instance, if a new job calling for new dies is received and it is necessary to make up the dies before forging production is started, the production card is placed on the space marked "Dies to Be Resunk and Repaired." Then when work is started on dies the card will be advanced to the proper space marked " Dies Being Resunk and Repaired," and when finally completed the card is advanced to the space, "Leads to be O. K.'d." It is understood, of course, that the die spaces while reading, "Dies to be Resunk and Repaired," and "Dies Being Resunk and Repaired," will cover also original die work. These cards all move from top to bottom of the board at all times under the heading of the equipment in which it is scheduled to operate, and the side spaces indicate the cause of moving the card.

Operation Boards in the Works

The board above described would not alone be of much help to the man in the works. Therefore we have taken care of him by having an operation board in the forge shop and another board in the die department. The board in the production office is the master board and all of the other boards are regulated from this board. The forge and die room boards are operated by plugs which fit in holes spaced on 1⅜-in. centers and each board contains 775 holes. These plugs are turned to ⅜-in. at the end that enters board and have a 1-in. top on which the die number and job number only are carried. These plugs are advanced to their respective places on the board, the same as the cards are advanced on the master board.

The forge department board shows six spaces as follows: Top row of holes shows dies operating in hammers and the holes just below are to show next dies going into the hammer. These are in space marked "Dies operating and next in hammer." The next space is

marked "Jobs not Complete." When dies are taken out of hammer before the job is completed and are still in good condition the plug is placed in the space marked "Not Completed." If no stock, hammer repair, die repair or dies to be resunk, the plugs are removed to proper spaces and remain there until removed by the operator of the master board. The board for the die sinking department is arranged very much the same as the forge board.

These boards all work in harmony with one another and lighten the foreman's load very much. It is the duty of the production engineer to see to it that the tools are made ready and in shape to keep the hammers running without interruption. Also to see that in case the dies or tools give out unexpectedly another job is scheduled up ahead ready to work. When jobs are so scheduled ahead it makes it easier for every one. The foreman does not have to worry about what goes in next. The die man, guided by his board, gets the next die to the hammer without delay, so that in changing dies as little time as possible is lost.

We know that any method, however good, must be followed closely, and what we claim for our method is simplicity, completeness, accuracy, and a lack of complicated detail. We are able to obtain production and efficiency records and satisfactory information at any time concerning work going through the shop.

The method as explained relieves foreman of planning and gives him the use of his time among the men, where he is more valuable, relieving him of much clerical work. He is the real producer, and unless he is on the job somebody may be inclined to loaf. The secret of the system is planning and scheduling with one idea, to harmonize all operations toward the maximum production and eliminate as far as possible all red tape.

Hammer-Hour System of Overhead

The hammer-hour system of overhead was discussed in a paper by R. T. Herdegen. He remarked that the three main items entering into the cost of the forging are material, labor and overhead. The first two of these are easily determined, but the overhead item affords a great opportunity for careful study. It is comparatively a simple matter to obtain the sum total overhead charge for any specific period of time, but the difficulty arises when it is desired to segregate this sum total overhead for applications to the various jobs that were running during that period. The time honored system of dividing this overhead is on the basis of productive labor. This is a simple system and has been passed on to the forging business from machine shop practice.

However, with the advent of massive machine tools the machine shop men began to realize that the division of overhead on the basis of productive labor charges could no longer be used, and the machine shop men started the system of charging the overhead against the expensive machine at so much per hour regardless of the productive labor charge. This was the beginning of the machine rate system. The forge business is now duplicating the experience of the machine shop and several forge shops have already abandoned the old system and are now operating under the machine rate system, or as it is called in the forge shops, hammer-hour rate system. The overhead of the entire factory is obtained and this should be divided among the various forge shop departments. This is a comparatively simple matter as practically all charges can be charged directly to one department or another.

The paper dealt exclusively with the problem of dividing the forge shop proper overhead among the various groups of equipment within that forge shop itself. It is not necessary to separate one hammer from another of the same size to determine an hour rate, it being sufficient to obtain the overhead for a certain group of hammers all about the same size and to divide that total equally among the hammers of that group. The paper went in very complete detail into the hammer-hour overhead system by selecting a hypothetical plant and grouping the various overhead charges.

Bonus Payments in Making Dies

The bonus system as applied to die sinking was the subject of a paper by A. A. Motherwell, Buick Motor Co., Flint, Mich. The die bonus system, he explained, is a method of placing all die work and machine work on a piece work basis, thereby putting it up to the worker to do his very best in the work for his own interest. When the system was first worked out the efficiency and cost departments in conjunction made a search of old records to arrive at the average time spent on all jobs when they were working on a day work basis.

In setting the standard time for jobs about 50 to 60 per cent of the day work average was taketn. For instance, on connecting rods, the average time consumed on each set of dies on a day work basis was about 140 hr. In setting standard time on the job we used 75 hr. or a little more than one-half of the former average time. On connecting rods we therefore have a standard time of 75 hr. per set for all work on the impression, edges and fuller. If a die sinker attains 75 hr. in sinking a set of these dies he has attained 100 per cent of efficiency and is paid 20 per cent bonus. The money value of each set is, therefore, equivalent to the day work amount of the worker plus 20 per cent.

For example, on connecting rods with 75 hr. set for the time, the job is worth to a 60-cent per hour die sinker 75 hr. at 60 cents (or $45) plus 20 per cent, or a total of $54. Now if a die sinker finishes a set of connecting rod dies in 40 hours he has been paid $24 in day work while doing this work, so he has $30 in bonus due, as the job pays him $54.

Again, if a die sinker does it in 75 hr,, the exact time given, he will still get a bonus of 20 per cent for attaining this figure, or a bonus of $9. Therefore, a die sinker will always get $54 for one set of these dies, including the day rate paid him for his actual work. It is, therefore, evident that he will make a special effort to finish a set of dies as soon as possible to attain a good hourly average for his payroll.

The bonus system has worked advantageously with us. One set of axles was finishd completely in 49½ hr., for which we paid $108 in day rate and bonus. When the job was done on a day work basis it averaged 340 hr. and cost $204. Jobs are being done in one-fifth the time formerly consumed and the die sinkers are still maintaining a high quality of workmanship, as the work is checked up closely and no flaws of any sort or careless finishings are passed. All classes of die work are on the same sort of basis, including planing, cherrying, trimmer and punch work, and we are even carrying it out with small repair work. Since the introduction of the bonus system the efficiency of the die shop as far as production is concerned has increased about 300 per cent, and the men are satisfied and strive to make the jobs as quick as possible, as no cut is probable in the standard time as set.

Mr. Motherwell emphasized that die sinking has always been a "bugaboo." Often plants are out of dies and hammers, and therefore idle. Something has to be done to have the dies waiting on the hammers, instead of the hammers waiting on the dies. He raised the wages several times and finally put the die sinkers on the piece-work bonus system, and finds that the men are satisfied, and he has no trouble in getting help. A production board is maintained and the work is taken out in regular order so that no favoritism is shown. During the past few months die sinkers have averaged $1.05 an hour. At first under the system some bad work was done, but this has been eliminated by inspection. Work is not paid for until approved by the department.

George Desautels, Imperial Drop Forge Co., doubted whether a premium system could work in the jobbing shop, unless the same product is being made over and over again, and did not think it fair to put the jobbing shop against the big production shop. Mr. Horne said that the premium system had been working successfully for a year in the die sinking department of the Packard plant. Exceptionally good men got exorbitant wages, which the company was glad to pay as the men were earning them. Mr. Motherwell declared that the time is coming when the bonus system will be a back number

and every employee will be one of the stockholders in the company. He believed that the bonus system could be worked out as well in a little shop as in a large shop. He stated that 95 per cent of the work done in the Buick plant is on the piece work basis, this including men who handle steel, and cut steel and handle scrap. He wished that the remaining 5 per cent could be put on piece work.

"Pickling and the Pickling Department" was the subject of a paper by J. Snyder, Mesta Machine Co., Pittsburgh, who went into the subject very completely.

Limits of Upsetting Operations

A paper on "Methods and Machinery for Upsetting Work" was presented by E. R. Frost, National Machinery Co., Tiffin, Ohio, who illustrated his talk with a number of drawings showing various upsetting operations. He said that 75 per cent of the failures of die designs can be attributed to one or more fundamental laws. He classed the majority of forge machine die problems under these three headings or rules.

1. The limit of length of unsupported stock that can be gathered without buckling is not more than three times the diameter of the base.

2. Length of stock of more than three times the diameter of the bar can be successfully upset in one operation, providing the diameter of the impression in the die is 1½ times the diameter of the bar. When the stock begins to buckle on account of the limited diameter of the hole the stock comes in contact with the side of the die. This prevents further buckling in this direction and any additional buckling is prevented.

3. This rule is a combination of 1 and 2. On any upset requiring more than three diameters of stock in length and in which the diameter of the hole in the die is 1½ times the diameter of the bar, the amount of unsupported stock beyond the face of the die must not exceed one diameter of the stock.

Producer Gas for Forge Shops

A paper on the application of "Clean Producer Gas in Drop Forging," prepared by Arthur L. Stevens, Chicago, referred to portable regenerative type of furnaces built by him for drop forge shops used in connection with gas that has been cleaned so that it can be conveyed to furnaces in small pipes. The writer estimated that the cost of a gas forge plant as compared with oil would result in a saving of $59,500 for an installation of twenty furnaces and a year's operation. However, he did not recommend the system for a plant using less than 1500 gal. of oil per day.

In the discussion a representative of the Timken-Detroit Axle Co. stated that a furnace of this type installed in that company's plant had not yet worked satisfactorily, but it was something new and he did not wish to convey the idea that the furnace was to blame. The furnace in the Timken plant is about 4 x 4 ft. and 8 ft. high, with the checkers above.

The fact was brought out that one drop forge plant is being laid out in which a furnace will serve several hammers. The application of gas producer furnaces to forge shops was declared to be still in an experimental stage, although these furnaces are now being quite largely used in glass manufacturing plants. Some reference was made to the use of pulverized coal for heating forge shop furnaces and the statement was made that the Sizer Forge Co., Buffalo, N. Y., is installing four furnaces, using powdered coal for heating ingots and utilizing the flue gas from the furnaces for generating steam for the steam hammers.

Heat Treatment of Forgings

James H. Herron, metallurgical engineer, Cleveland, gave an interesting talk on "Heat Treatment of Forgings." A summary of his discussion, which had not been prepared in the form of a written paper, is as follows:

There are a few fundamental facts in the heat treatment of drop forgings which should be carefully regarded before work is undertaken of this character.

We have so-called annealing, which is only partial annealing, that is, heating the steel to some point below the critical point and either cooling slowly or quenching in water. This should be styled partial annealing, and is used with advantage to soften steel which has previously been hardened for machine purposes. It has its greatest effect in the second treatment of the so-called heat treating operation.

In drop forging the steel is primarily heated to a fairly high temperature so that it will readily flow to conform to the dies. Some parts of the forgings are hammered considerably, other parts being hammered practically not at all. While the parts hammered considerable will assume a better structure, owing to the mechanical work done upon them, the parts that have received practically no hammering will remain in structure that the high temperature of the initial heating gives. It is evident, therefore, when a drop forging is made that it is heterogenous, so far as the structure is concerned. The strength of such a forging is 10 to 20 per cent lower than a forging which is homogeneous in structure. Clearly drop forgings should be properly annealed, that is, heated to a point above the critical point only, rendering the structure homogeneous and of equal strength throughout the entire forging. This is a matter of the utmost importance, and this proper annealing not only refines the structure, but will relieve the strains set up by unequal hammering.

The rapidity of heating the material is important. Materials of large masses should not be heated too rapidly nor to too high temperature. The phenomenon of change as the material passes through the critical range is such that strains are likely to be set up which will cause checking or other forms of structure, rendering the material quite useless for any purpose. There is also a phenomenon that steel heated to a high temperature and allowed to cool slowly does not seem to lose greatly in ultimate strength, but does lose greatly in the elastic limit and elongation, so that all material should be heated only slightly above the critical point to give the physical properties of which the material is capable.

Entertainment Features

The entertainment features provided during the convention were very much enjoyed. On the first day the Drop Forge Association acted as host and provided the entertainment. On Friday the expense of the entertainment was borne by the Supply Association. The entertainment in addition to the noonday luncheons included an association banquet for the men, Thursday evening, and a banquet for the men and ladies Friday evening, this being followed by dancing. An informal speech making program was carried out after the Thursday evening banquet. Among the speakers was H. N. Taylor, president of the Drop Forge Supply Association. On Saturday forenoon a trip was made by automobile to the plant of the Cleveland Hardware Company, a large manufacturer of automobile forgings.

The Cleveland committee in charge of the local arrangements comprised George I. Allen, Heppenstall Forge & Knife Co.; John Blakeslee, Ajax Mfg. Co.; Alvan A. Gay, Cleveland Hardware Co., and J. T. Connelly, Champion Mfg. & Forging Co.

The National Acme Co., Cleveland, has placed an order with the Buffalo Forge Co., Buffalo, for complete heating and ventilating equipment, consisting of four Carrier air washers with automatic control and fresh and return air dampers; four ventilating fans; four exhaust fans; 10 baby Conoidal fans for toilets, 27,000 sq. ft. of Vento indirect radiation and four 12 x 14-in. steam engines for driving the fans. George S. Rider & Co. are the consulting engineers.

The plant of the Union Drawn Steel Co., Gary, Ind., has been completed and the company is now planning to build 20 to 30 houses for its employees. The company will employ about 500 men. F. N. Beegle is president.

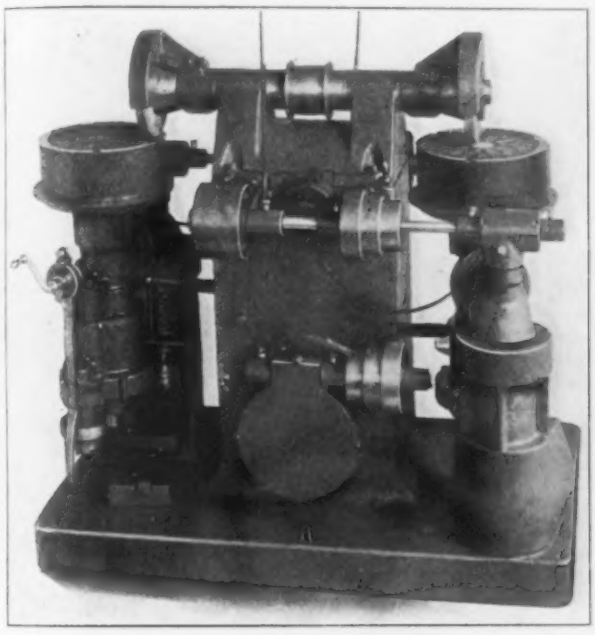
Three hundred car builders, car repairers, machinists and boilermaker helpers at the Baltimore & Ohio shops at Washington, Ind., have received an increase in wages of a cent an hour.

Double Rotary Surface Grinding Machine

An interesting type of rotary surface grinding machine has been brought out by the Globe Machine & Stamping Co., Cleveland. It is really a double machine arranged so that the two wheels are operated independently of each other, thus giving the productive capacity of two machines of the conventional type with, it is emphasized, a smaller amount of labor and attention.

The grinding wheel head is fastened to the frame in a fixed position which, it is pointed out, provides rigidity and prevents the wheel head from being thrown out of alignment. The rotary magnetic chucks, which are 12 in. in diameter, are mounted on counterbalanced swinging arms that are provided with thrust bearings of the ball type. A cam and rocker arm having means for adjusting the length and position of the stroke takes care of the swinging of the chuck supporting arms.

Each operating unit is separately controlled and the speeds, feeds, etc., have independent drives, which makes the machine practically a double one. With this arrangement the mechanism of one chuck and grinding wheel can be operated as a unit independently of



The Work Is Placed on the Rotary Magnetic Chucks and Is Surfaced Automatically by the Grinding Wheel Which Is Fixed in Position

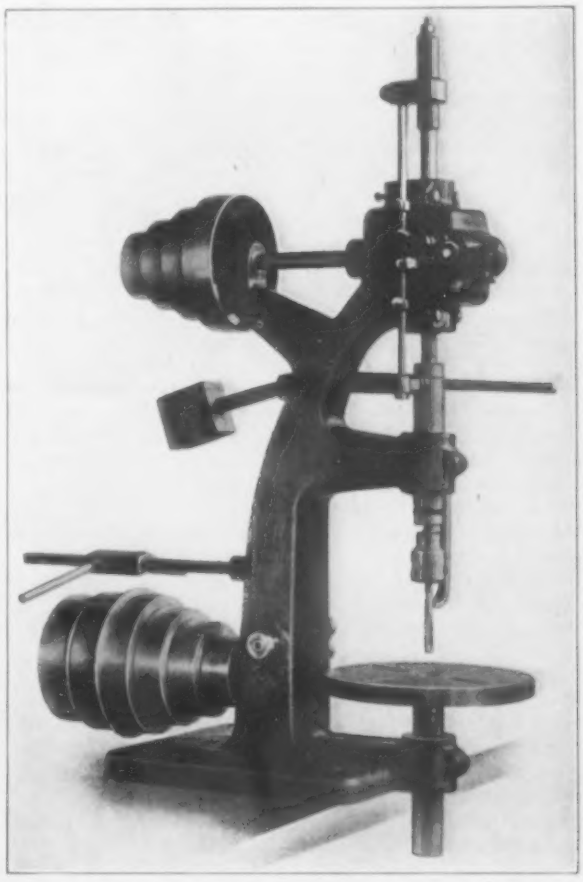
the other, thus enabling the operator to prepare work on the idle chuck while pieces are being ground on the other. It is possible too, it is explained, to operate both chucks simultaneously, thus permitting the operator to give his attention to another task. An automatic feed and stop are provided which enable the work to be fed to the wheel at rates ranging from 0.0005 to 0.005 in. for each stroke of the machine, it being possible to release the feed at any point. This arrangement also allows the operator to prepare work without interfering with the output of the machine. Three speeds are provided for the traverse of the work and for the revolution of the chucks. It is possible to grind six piston rings 3¾ in. in diameter on each chuck simultaneously. Work may be ground either concave or convex by setting the chucks.

The power-transmission safety code presented to the joint meeting of the American Society of Mechanical Engineers and the National Machine Tool Builders' Association in Cincinnati has also been recognized by the National Association of Manufacturers. A copy may be obtained undoubtedly by applying to the American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York, or the National Association of Manufacturers, 30 Church Street, New York.

Bench Tapping and Drilling Machine

A new automatic tapping and bench drilling machine has been put on the market by W. H. Simmons & Co., 208 Lawrence Street, Cincinnati, under the trade name of Cinti.

The clutch and reversing mechanism can be set to run the tap to any desired depth. The tap is reversed



Adjustments Are Provided in This Bench Tapping and Drilling Machine to Reverse the Tap Automatically When the Bottom of the Hole Is Reached and Stop the Spindle After the Work Is Cleared

automatically and after it clears the work the spindle stops automatically. The clutch, as well as all other contact points, is hardened. The spindle is equipped with a lead for any pitch thread desired, but 16, 18, 20 and 24 thread leads are standard. It will drill or tap to the center of a 12 in. circle.

The belt-tightening device is very simple and is operated by the knob on the right side of the column near the base. Any desired tension can be secured.

The following table gives the general dimensions and specifications of the machine:

Maximum distance spindle to table, in.	10½
Vertical adjustment of spindle, in.	3¼
Vertical adjustment of table, in.	5
Diameter of spindle in sleeve, in.	13/16
Diameter of table, in.	10
Diameter of smallest cone pulley step, in.	3½
Diameter of largest cone pulley step, in.	7
Width of belt, in.	1½
Diameter of tight and loose pulleys, in.	7
Face width of tight and loose pulleys, in.	1¾
Tapping capacity in cast iron, in.	⅝
Drilling capacity in cast iron, in.	½
Number of spindle speeds	4
Minimum spindle speed, r.p.m.	150
Maximum spindle speeds, r.p.m.	600
Speed of tight and loose pulleys, r.p.m.	300

Bronze bearings are furnished throughout and the lower pulleys are bronze bushed.

The number of women munition workers in England in January, 1917, was 691,000, according to *Engineering* of London, while in July, 1914, the number of women so engaged was 221,000. A prominent engineer has expressed his conviction, it is stated, that with two more years of war he would undertake to build a battleship in all its complex details entirely by women labor.

Carbon Monoxide Dangers at Iron Works

Methods by Which Hazard Is Reduced—Results of an Investigation by the Bureau of Mines

WASHINGTON, June 19.—The liability to carbon monoxide poisoning of those employed in the various departments of a steel plant is the subject of a technical paper about to be issued by the Bureau of Mines, from which the data given below are taken. Attention is given primarily to the liability to chronic poisoning—that is, the daily exposure of employees to small quantities of this gas over an extended period of time—rather than to that of acute poisoning, or "gassing," as prevention of this accident is a problem of safety engineering rather than of industrial hygiene. Rapid and serious poisoning rarely occurs except where the atmosphere is suddenly and grossly polluted with gas because of a breakdown or because of faulty operation of machinery. Such conditions are usually unforseen, soon discovered, and quickly corrected. It is important, therefore, to call attention to the effects of the continued presence of small quantities of this gas, which, although insufficient to cause acute symptoms of intoxication, will nevertheless by insidious action finally bring about the same result—that is, total or partial incapacitation of the worker.

From the viewpoint of the physician interested in occupational diseases, or of the industrial hygienist, carbon monoxide is the most important of the poisonous gases. This gas occurs so frequently as either a product or a by-product of many industrial processes that those employed in or around such processes may be, and often are, exposed to its action. The presence of this gas in a place where men are at work, even though it be confined to the interior of manufacturing appliances and equipment, is a hazard, for experience has taught the difficulty of preventing leaks and the serious and rapid results that follow inhalation.

Carbon Monoxide in Steel Plants

The use of gases with a large carbon monoxide content has greatly increased in the steel industry. Also, the institution of new manufacturing processes in which carbon monoxide is a by-product has brought about additional hazards of carbon monoxide poisoning. In a steel plant carbon monoxide may be found about blast furnaces, gas washers and scrubbers, gas engines, gas producers, gas boilers, cupola furnaces, dolomite furnaces, "dinkey engines" or small locomotives, and "shanties" or rest rooms for employees.

Blast Furnaces

The smelting of iron ore, coke and limestone gives rise to enormous quantities of gases—about 150,000 cu. ft. per ton of fuel consumed. Blast-furnace gas contains 22 to 27 per cent carbon monoxide. The gas passes from the top of the furnace into a large "downcomer," thence through conduits or mains to the scrubbers or washers, where much of the suspended matter is removed. This gas is used to heat the blast and is burned under boilers or in gas engines for the production of motive power.

Those workmen who are employed about equipment for the transmission or utilization of blast-furnace gas are liable to carbon monoxide poisoning. Owing to improved methods of construction and operation and the rare exposure of men at the furnace top, the hazard of gas poisoning at the furnace top, which was formerly great, has been reduced. Nevertheless, gas is practically always present about the top of the furnace in sufficient volume to cause asphyxiation if breathed for some time. If a man should become "gassed" while working on top, the gassing would be acute in character. Proportions sufficient to cause asphyxiation may occur also all along the route of the gas. Some leakage may occur at times through the "downcomer" pipe or conduit leading to the scrubbers. Leaks may also occur at times through the furnace wall, although rarely or except when blowing in a furnace. There is always some leakage, although in varying amounts, from the tapping hole and slag notch while they are open during casting. The gas as it comes from the furnace can be easily detected by the eye, owing to the dusts suspended in it, and by its distinctive odor. After passing through the washers, where it is freed from its suspended matter, it is usually invisible and practically odorless. Therefore, although those working around the blast furnace receive some warning of its presence when it escapes, this advantage is lacking in working places where the gas is used after it has been washed.

Gas Engines

A common use of blast-furnace gas is to drive gas engines. The gas, after being washed and deprived of most of its suspended matter, is conducted to the engine house through a main beneath the floor and is distributed to the various engines. Precautions are generally taken to insure that mains and distributing lines under the floor of the engine room are all gas-tight, yet leakage often occurs, sometimes in sufficient quantity to cause collapse of exposed workers from acute poisoning. The usual location of such leaks is at joints, unions, valves, and sometimes at faulty water valves. On the engine room floor and around the engine small leaks are frequent, as it is practically impossible to keep all joints, unions, cylinders, stuffing boxes and the like gas-tight under such conditions as vibration, engine strain, and the expansion and contraction of metal parts from changes in temperature. This is especially true when the engine is started under a heavy load or when ignition is unsatisfactory. At one plant cases of carbon monoxide poisoning occurred regularly over an extended period of time in spite of all precautions to avoid leakage. Gas may also escape from the exhaust system. The exhaust gas has a carbon monoxide content varying from 22 to 27 per cent if unexploded and from 0.35 to 1 per cent if exploded, depending directly upon the proportion of air mixed with the gas in the carburetor, the amount of gas supplied the engine, the speed of the engine, the load it carries, and the extent to which combustion takes place.

Gas Producers

The use of producer gas in the industries has increased markedly in late years. In steel plants it is burned for many purposes, principally for heating metal. The gas is manufactured at the plant in large quantities and a considerable number of men are employed solely in its manufacture. In addition to leaks which sometimes occur in the producer walls or other parts, such as conduits, unions and valves, a conspicuous source of the gas is at the hoppers. In order to facilitate his work, the fireman allows the hopper lid to remain partly open. The producer gas, which has a carbon monoxide content of about 20 to 25 per cent, escapes rapidly in large quantities, grossly polluting the atmosphere near by. In addition to carbon monoxide, producer gas contains a large amount of suspended matter consisting of carbon products, such as soot. Symptoms of insidious carbon monoxide poisoning are common among those employed in this department of a plant.

Gas-Fired Boilers

Blast-furnace gas is also burned under steam boilers. A number of cases of carbon monoxide poisoning in boiler rooms have been reported, most of them acute in character and due to large leaks. Also lesser leaks occur, which pollute the atmosphere and expose the firemen and boiler tenders to small quantities of the gas. Such leaks are usually due to faulty conduits, leaky

unions or valves, or to improper mixing with air and resulting incomplete combustion of the gas. Gas in such small amounts cannot often be detected. At one plant a man went to sleep near a gas-fired boiler and was fatally asphyxiated while asleep, although men worked around the boiler previous to and after this accident without noticing any ill effects.

Cupola Furnaces

At the foundry, open-hearth furnaces, and other places, cupola furnaces have been constructed and operated in many instances in such a manner as to allow considerable opportunity for escape of gas containing carbon monoxide. Cupola furnaces are usually open at the top, so that the amount of gas which escapes and the resultant pollution of the air are dependent upon the condition of the furnace, its load, and the efficiency of operation. In some instances the place of duty of the worker is above the furnace, although slightly to one side, as in the case of the cranemen and chargers. Acute poisoning among cranemen and chargers became severe and occurred with such regularity at one plant that difficulty was experienced in obtaining men to fill these hazardous positions. It is probable that small leaks of gas also occur through the cupola wall and from the tapping hole during casting.

Dolomite Furnaces

At certain steel works dolomite ($CaMgCO_3$) is burned with coke in furnaces as part of its preparation for use as a refractory material in the plant. One of the products of this combustion is carbon monoxide. The furnace being open at the top, this gas freely escapes into the air breathed by men employed in this department, provided that the temperature at the point of escape is not equal to nor above that at which carbon monoxide is ignited. Chargers and cranemen are particularly apt to be exposed, as they work at times around the top of the furnace. Other employees are at times also required to work about the furnace top.

Dinkey Engines

The small locomotives known as "dinkeys" are much used at steel works because of the area covered by a modern plant and the dimensions, weight and amount of the material handled. These engines give off surprisingly large amounts of smoke. Frequently they remain for considerable periods of time in a building housing the producing department of a steel plant. Though much progress has been made in reducing smoke from furnaces, factories and power plants, little advance has been made in the case of locomotives. Fatal carbon monoxide poisoning from locomotive smoke is not uncommon, especially in tunnels, and although of relatively small importance as a hazard in the steel industry, attention is called to this source and the attendant danger, especially when these locomotives remain in buildings for a long time, for then conditions are such as approach those in railroad tunnels.

Shanties or Rest Rooms

It is the custom in many steel plants to construct small inclosures, 3 to 4 ft. square, in which employees may rest when off duty. These are usually in use only during cold weather, and when so occupied they are heated with an open coke fire in a salamander. A few fatal cases of carbon monoxide intoxication have been reported, and slight gassing occurs with some frequency among workmen in these shanties, especially if they are closed in.

The Bureau of Mines has developed a simple apparatus used in the analysis of air samples taken for the determination of carbon monoxide, a full description of which is set forth in Bulletin 42. Experience has shown that so small a quantity of carbon monoxide as 0.01 per cent may result in serious symptoms, especially if the exposed person does much physical work.

Reducing Hazard in Steel Plants

The localities in a steel plant where gases containing carbon monoxide are handled or where carbon monoxide results as a by-product of some industrial process are easily determined by those in executive positions in these plants. A survey should be made with a view of determining whether this poisonous gas is escaping in the atmosphere breathed by workmen, and some system of regular periodical inspection instituted whereby places where gas could be watched and carbon monoxide pollution guarded against. It is a comparatively simple matter to obtain samples of the air at these places, and they could therefore be taken by unskilled persons. The method used by the writer in obtaining the samples reported in Table 1 is very simple and could be utilized for such work. Most steel plants employ chemists of ability and maintain well-equipped laboratories. The qualitative or, if need be, the quantitative determination of the carbon monoxide content of these samples could be made with little additional expense or labor in the chemical laboratory. It is believed that this would be a desirable step on the part of the operators.

Carbon Monoxide Pollution of the Atmosphere

Should such a system of regular air sampling be instituted and the laboratory reports indicate carbon monoxide in dangerous quantities, steps should be taken to tract the exact source of the gas. Should this be a leak in a conduit, gas main, or engine, immediate steps should be taken to make these gas-tight. It is probable that slight difficulty may be experienced in some instances, as, for example, at the gas engines, but it is believed that the leakage of gas from other places could be so prevented as to reduce carbon monoxide hazard to a minimum. If the origin of the carbon monoxide should be the result of an industrial process, as, for example, that of burning dolomite or at the cupolas, the methods of operation or of construction should be altered in order to do away with this hazard. In all places where there is likelihood of the air being polluted by carbon monoxide, provisions should be made for ample ventilation, both by natural and artificial means. Buildings housing equipment hazardous from gas should be large, with a high roof, and constructed with ample means for a free exchange of outside air, such as doors, windows, and ventilating shafts in the roof. If possible they should be open on two or more sides as are the casting sheds at the blast furnaces. Where such provision cannot be made, as, for example, in the gas-engine house, artificial means of ventilation should be installed. An exhaust and supply system is most important in engine rooms. In the case of gas engines, the pistons, crossheads, and connecting rods, as well as the space between cylinders of tandem engines, should be inclosed with light sheet-metal housings, made easily removable and connected with air-exhaust systems. Such hoods should be provided with gas-tight doors for ready inspection.

Finally, where none of these methods is applicable, or if instituted fails to prevent the pollution of the air by carbon monoxide, operating conditions should be so altered as not to require men to remain in such hazardous places for more than short periods of time.

W. L. C.

Reward for Regular Attendance

In its recent advance of wages, the Carpenter Steel Co., Reading, Pa., adopted some interesting provisions intended to encourage regular work. The emergency wage for all employees was increased from 10 to 15 per cent of monthly earnings, exclusive of any attendance premium. A premium for attendance is to be paid on each pay-day to workmen in the operating department as follows: For workmen rated at below 25 cents per hour base pay, the premium for working full time throughout a pay period (half month) will be 10 per cent of the base wages earned. If time is lost, but not to exceed one day or any part thereof in a pay period, the premium will be 5 per cent of the base wages earned. For workmen rated at over 25 cents per hour base wage, premium for working full time throughout a pay period will be 2½ cents per hour. If time is lost, but not to exceed one day or any part thereof, the premium will be 1¼ cents per hour. Piece or tonnage workers will be paid for full attendance on the same basis as workmen rated at over 25 cents an hour.

Chemical Reactions of Iron Smelting*

Indirect and Direct Reduction—Premature Combustion and Its Prevention—Excessive Carbon Deposition and Its Cause

BY WALTHER MATHESIUS

Walther Mathesius

THROUGHOUT the Middle Ages, and as late as the first half of the nineteenth century, blast furnaces were operated the world over with the utmost of secrecy. Those skilled in the art carefully guarded their knowledge, surrounding their work with a veil of mystery and handing it down from father to son as a precious tradition.

There are still many adherents to the creed that blast furnace progress must be brought about through practice, leaving it to science to afterwards explain the "whys and wherefores." Men of this type overlook the fact that, since the introduction of hot blast, when explanations were sadly lacking for the startling improvement wrought thereby, science has made gigantic strides to close the gap between actual results and their theoretical understanding. As the day draws near when the scientist will wring from the blast furnace his last mystery and will mark it down with mathematic exactness, the theory of the blast-furnace process demands of the furnace operator more respect and attention than ever before. While he may not care to follow all the intricate lanes of research and experimentation that have led to the present knowledge, he should have a thorough understanding of the process with which he deals, and it is from his standpoint that I intend to review the reactions of iron smelting as carried on in the blast furnace of to-day.

Physical and Chemical Duties

The task of the blast furnace, while performed as one continuous and interlocking process, may be divided into physical and chemical duties. Among the former the principal items are:

The drying and preheating of the burden materials.
The melting and superheating of the resultant iron and slag.

The chemical duties comprise chiefly the following:

The calcination of the carbonates.
The reduction of the metallic oxides of the ore burden.

The relative importance of the physical and chemical work may be best judged by comparing the amount of energy consumed by each. This can readily be calculated by establishing a heat balance.

An average taken from a number of such calculations covering modern operations shows that, of the total heat introduced into a blast furnace and generated therein, approximately 25 per cent is sufficient to take care of the above-mentioned physical duties, while the chemical reactions require about 60 per cent of the total, the balance being absorbed in radiation losses and heat escaping with the gases. These figures gain particular interest when considering that it is the physical part of the blast furnace work only that is immediately accessible to observation and measurement. Any improvement or deterioration in the chemical work must affect the furnace efficiency as a whole to more than double the extent than would a change of equal magnitude in the physical or melting operation. Economy in the performance of the chemical reactions is, therefore, of prime importance to the blast furnace man.

From the total amount of coke which is charged into the blast furnace, a certain percentage is always carried out by the furnace gases as coke dust, and another portion is dissolved by the pig iron. At plants using similar raw materials, and under normal operating conditions, the sum of these two items varies only within narrow limits and amounts to a small percentage of the total. It does not decidedly influence the general efficiency of the furnace operation. The fuel consumption depends almost exclusively on the mode of gasification and utilization of the remaining major portion of the carbon in the coke. The possibilities in this respect are:

1. The carbon, having passed downward through the furnace stack, reaches the hearth and is gasified there either by:
   (a) Combining with the oxygen of the blast at the tuyeres, or
   (b) Combining with the oxygen of metallic oxides (direct reduction).
2. The carbon does not reach the hearth, but is gasified above the hearth by reacting with the CO_2 of the furnace gases (premature combustion).

The reactions classed under 1 are normal operating necessities. Reaction (a) creates heat and reducing gas (CO); reaction (b), while consuming heat, furnishes reducing gas and pig-iron product. As long as their sum-total and their relative proportion remain within proper limits, these reactions must be classed as desirable, while an excess of either one is superfluous and detrimental.

The reaction named under 2 produces, at a loss of heat, reducing gas only, which, if at all required in the operation of the furnace, could be more advantageously furnished by either reaction 1(a) or 1(b). The premature combustion of carbon must, therefore, in all cases be considered a detrimental reaction.

All three of these reactions have one thing in common. They produce carbon-monoxide, the agent by means of which by far the largest portion of the metallic oxides in the furnace burden is reduced to metal. This process, for which the equation $Fe_2O_3 + 3CO = 2Fe + 3CO_2$ may serve as an example, is known as "indirect reduction." Its economy is in a large measure responsible for the remarkable efficiency of the blast furnace, which to the present day has not been surpassed by any other metallurgical process.

Indirect and Direct Reduction

From a standpoint of economy, the indirect reduction is more desirable than the direct reduction. The latter is economically permissible only under the following conditions: First, where indirect reduction cannot take place—for instance, when reducing oxides are not accessible to furnace gases; and, second, in case the combustion of carbon by the oxygen of the blast at the tuyeres does not furnish sufficient carbon monoxide with which to properly take care of the indirect reduction.

Direct reduction, as mentioned first, takes place in every furnace and is a function of the composition of the iron; in other words, the percentage of silicon, phosphorus, manganese, etc., to be reduced and of the percentage of burden materials, the metallic contents of which are for physical or chemical reasons not accessible to the reducing action of the furnace gases. With these conditions given, this phase of direct reduction can be considered as practically constant.

The other case of direct reduction, which is due to scarcity of CO from combustion at the tuyeres, is most likely to be incurred where furnaces are burdened with ores that are easily reduced, and where such furnaces

*From a paper presented at the Twelfth General Meeting of the American Iron and Steel Institute in New York, May 25, 1917. The author is superintendent of blast furnaces, Illinois Steel Company, South Chicago, Ill.

are operated at a fast rate of driving, with high-blast temperatures. Under such conditions, direct reduction will take place to a greater extent the lower the percentage of silicon is in the pig iron. Modern Mesaba practice on basic iron is a good example.

The extent to which the various reactions will perform within the blast furnace depends in a large measure upon the reacting speed of which they are capable. The speed of any chemical reaction decreases the closer the relative quantities of the reacting and resulting substances approach the status of equilibrium. Therefore, the various reactions will, within the limited time available in the blast furnace, take place to a larger extent the farther away the relative quantities remain from the status of equilibrium. In other words, in order to be reducing to a degree sufficient for actual practice, the furnace gases must be richer in CO than would be expected from the experimentally determined diagram of Baur and Glaesner.

Thus the possibility of a modern furnace being insufficiently supplied with carbon monoxide through the combustion of carbon at the tuyeres is by no means remote. It is incurred particularly where, with easily reduced ores, high blast temperatures are used, because with higher blast heat the generation of the necessary quantity of heat in the hearth requires less carbon. Theoretically, and keeping strictly within the boundaries of Gruner's theory of the ideal working of a blast furnace, this condition should be remedied by lowering the blast temperature and burning more carbon at the tuyeres. Otherwise, ore must reach the hearth without being properly reduced by the gases, there to be reduced by solid carbon, with a consequent loss of heat to the hearth.

In modern practice this question is solved differently and more economically by permitting direct reduction to take place and at the same time offsetting the entailing heat loss by raising the blast temperature. The limit to which this direct reduction can be carried on depends on the ability to offset the resultant heat deficit in the hearth by higher blast temperature, and on the necessity to keep the top temperature above the desired minimum which is essential for the timely drying and preheating of the ore charges preparatory to their reduction by the furnace gases.

The results obtained may briefly be summed up as follows: Without raising the volume of wind blown, the amount of carbon gasified in the hearth and the weight of metallic oxides reduced per unit of time is increased. The furnace operates at a higher rate of output without requiring additional coke for its hearth reactions. As the cooling and radiation losses per ton of iron are inversely proportional to the rate of production, a saving is effected in this respect, which must ultimately find its expression in a lower coke consumption. As part of the coke carbon is gasified by oxygen from the ore without the addition of nitrogen from the blast, the amount of gas per unit of burden material charged becomes less. The initial temperature of the gas leaving the hearth not being changed, this results in a lower top temperature as well as a lower temperature of the stack. The beneficial effect of this drop in stack temperature on coke consumption and on furnace practice in general will be dealt with later.

Premature Combustion

At temperatures below 900 to 1000 deg. C. premature combustion does not take place to any appreciable extent, as can readily be seen from the curves of equilibrium established by Bondouard. Since its reacting speed grows rapidly with rising temperatures, it is evident that premature combustion must take place in the furnace stack at an increasing rate the higher the temperature of the zone in which the carbon dioxide and the coke come into mutual contact and the longer they remain in contact with each other at temperatures above 900 deg. C.; that is, generally speaking, the higher the average stack temperature of the furnace happens to be. Thus it occurs to a large extent in furnaces making high silicon iron, or furnaces operating on a highly refractory burden, for instance, of magnetite ores. Under such conditions, carbon monoxide is produced over and above the already existing abundance, which has resulted from extensive direct reduction, and which cannot be used to any advantage in the furnace.

In furnaces producing low silicon iron and operating on an easily reduced ore burden, premature combustion may also assume serious proportions, where the rate of driving is too slow and the time is thus unduly prolonged during which carbon dioxide remains within the regions of high temperature in contact with coke. The apparently logical means of counteracting this condition is "faster driving." In many cases this can only be practised after a change in the quality of coke has been brought about.

Among the ways and means which counteract premature combustion and are practised, aside from faster driving, I wish to mention one which is now so universally used that its value is often overlooked. I refer to the use of raw limestone as flux. Realizing that it took a considerable amount of heat to calcine the stone, and in an effort to relieve the blast furnace of this duty, the attempt was repeatedly made in past days to charge burned lime in the place of raw stone, but without attaining the expected improvement.

The explanation lies obviously in the fact that the endothermic calcination of the limestone, which takes place above 900 deg. C., is one of the most effective means to quickly bring about a cooling of the furnace gases below the zone of temperature where premature combustion can take place; it appears that thereby, and by simultaneously preventing premature fusion of the ores, which would place the latter beyond the reach of indirect reduction, more coke is preserved and made available for the generation of heat at the tuyeres than is necessary to furnish the heat required for the calcination of the stone.

Another most effective means of preventing premature combustion is the application of high blast temperatures. By thus accelerating combustion at the tuyeres, providing for the heat requirements of the hearth with less fuel and a consequently lower volume of gases, concentrating the zone of highest temperature and increasing the ratio of descending materials to rising gases, a decided lowering of the average stack temperature with correspondingly better fuel economy can be and has been accomplished. For instance, the blast furnaces at South Works, Illinois Steel Company, being operated according to these principles, have for a number of years, in spite of a severe handicap in the form of irregular coke supply, not for a single month exceeded a coke consumption of 1900 lb. per ton of iron for 21 consecutive months. During the year 1916, these same furnaces, with an average age of 331,771 tons per lining, produced 2,066,256 tons of iron on an average coke consumption of 1854 lb. per ton.

From the analysis of the various reactions, it is evident that direct reduction and premature combustion in reference to origin, performance and prevention are two distinctly and entirely different processes, each one independently playing its own important part, in widely varying degrees, in every furnace operation. The only common tie between them is their endothermic character and the fact that they both consume carbon. The sum-total of their carbon consumption represents what is usually called the amount of carbon gasified above the tuyeres. As this carbon is consumed partly by economical and partly by wasteful reactions in ever-varying proportions, it is evident that the relation of this total "carbon gasified above the tuyeres" to the fuel consumption of a furnace cannot possibly have a direct bearing on the economy of the furnace operation.

Carbon Deposition

To complete this review of blast-furnace reactions, I wish to mention one which in modern furnaces appears only occasionally to any extended degree. This is the decomposition of carbon monoxide according to the equation $2CO = C + CO_2$.

As the speed of this reaction is comparatively low, on account of the existing ratio of quantities involved, and since the zone of temperatures within which it can take place is limited to approximately from 400 to

600 deg. C., the extent of this reaction is, as a rule, slight. Theoretically it must be classed as economical, being exactly the reverse from "premature combustion." However, in practice, when this reaction takes place to any considerable degree, serious difficulties are encountered which make it extremely undesirable. The resulting carbon is deposited on the ores in a very finely divided form and interferes with their permeability to the gases, clogging the voids and causing a swelling of the charges, scaffold formation and all the serious troubles which follow.

When fine Mesaba ores were first used in larger percentages, such difficulties due to excessive carbon deposition were experienced more frequently. With furnace lines poorly suited for the smelting of these fine ores, particularly with the flat bosh angles then in use, irregular working of the furnace with protracted periods of hanging were nothing exceptional. The movement of the furnace charges being brought to a standstill for considerable periods of time, a much larger percentage of the materials in the upper part of the furnace stack was heated to a temperature where decomposition of carbon monoxide could take place, with a corresponding increase in the extent of this reaction as the result. Since then, however, furnace lines have been improved to such an extent as to make operating difficulties from this source a rare exception in Mesaba practice.

It has been observed, too, that a high percentage of hydrogen is often present when carbon is deposited in this manner. The reducing power of hydrogen relative to that of carbon monoxide increases with falling temperatures, and it is reasoned that, with a high percentage of the former, metallic iron in finely divided form is reduced from the ores at exceptionally low temperatures; this metallic iron then acts as a catalytic agent which greatly increases the reacting speed of the decomposition of carbon monoxide.

Excessive hydrogen in the top gases to an extent necessary to bring about such a condition is generally the result of defective apparatus, such as leaky hot-blast valves, tuyeres and bosh plates. If this be the case, the undesirable deposition of carbon can be overcome by removing the source of the hydrogen.

From the standpoint of an operating man, I have attempted to give a brief outline of a subject about which volumes have been written by men of science without ever covering the field. To them belongs the task of further theoretical exploration. We blast-furnace operators must be ready to apply and prove in practice.

New Plant Completed

The American Valve & Tank Co., Indianapolis, will move to its new plant at Fairmont, W. Va., this week. The new plant provides for a larger output, and the buildings have all been constructed with a view to future expansion. The site is 210 x 1100 ft. The main building is located just in the rear of the general offices and contains the machine shop, plating department, painting department, testing department, stock room and shipping department. The foundry building contains the iron and brass foundries, stock room, cleaning room and core department, with the cupola located in the center so that the metal may be distributed over the various casting floors with equal facility. The plant is equipped throughout with electric power and an abundance of light and ventilation is afforded by monitor construction and Fenestra sash. Transportation facilities are furnished by the Baltimore & Ohio railroad, the tracks of which are directly in the rear of the plant, and by the Monongahela river packets.

Gould & Eberhardt, manufacturers of shapers, gear cutters and other machine tools, will vacate their plant at 111 New Jersey Railroad Avenue, Newark, N. J., in about two months to occupy a new concrete factory building which is now being built for them at Irvington, N. J. The equipment for the new plant has already been contracted for.

SHEET CONTRACT REFORM

Progress Made by the Manufacturers' Association —Other Lines Share It

The National Association of Sheet and Tin Plate Manufacturers has issued from its offices in the Oliver Building, Pittsburgh, "Contract Pamphlet No. 2" as part of the effective propaganda the association is carrying on in behalf of contract observance in the sheet and tin-plate industries. Since the organization of the association last year a uniform contract has been approved, which has been widely published, and is now in use by nearly all the members as well as by various iron and steel manufacturers. The new pamphlet says that except for Government requirements and unsatisfactory traffic conditions nearly all sheet and tin plate manufacturers would complete in June contracts calling for delivery over the first half of 1917. This is the first time in many years that this condition has existed on an advancing market. It is stated that the practice of guaranteeing against market decline is rapidly disappearing regardless of the form of contract used.

The association recently addressed a letter to manufacturers of iron and steel in the United States and Canada asking as to their practice in the making of contracts, whether they would co-operate in the association's efforts to abandon price guarantees and also whether they would use its form of contract. The pamphlet prints replies received to this inquiry. These indicate progress in the establishment of definite contracts, though it is not to be overlooked that extraordinary market conditions have put such matters largely in the seller's hands. E. J. Buffington, president Illinois Steel Co., writes that his company "has for years past adhered inflexibly to the use of sales contract forms under the terms of which both the buyer and seller are irrevocably obligated to carry out the provisions of the contract. We do not make sales contracts under which deliveries or other terms are optional with either buyer or seller, our practice being to adhere strictly to the principle, 'A contract is a contract.'"

E. A. S. Clarke, president Lakawanna Steel Co., writes: "I am a thorough believer in this general idea, and, as you know, have done considerable work along this line; and I agree with you that there is no doubt iron and steel manufacturers could at this time make and introduce a permanent contract reform had they the courage and determination to do it. But, on the other hand, I believe this can only be successfully done by having practically all the manufacturers act in unison, and, from such expressions of opinion as I have heard from time to time, I doubt whether this can be accomplished at the present time."

T. M. Adams, president Norton Iron Works, Ashland, Ky., says: "We are in the nail, wire and pig-iron business, and while the pig-iron contract binds, the nail and wire contract is a scrap of paper. We most assuredly favor the idea of the nail and wire manufacturers adopting your form of contract, but we have received no advice from any one of our competitors and are, therefore, unable to foretell how the matter will commend itself to them."

The pamphlet has a discussion by T. D. McCloskey, attorney, of the "Liquidated Damages" section in the association's contract form. On another page is this interesting comment on the present conditions in the sheet and tin-plate market: "Both buyer and seller are now exercising caution and contracting only for such tonnage as can be shipped by the seller and specified for and received by the buyer. Under these conditions, as stated by G. H. Jones, vice-president Inland Steel Co., 'the astute buyer will carefully consider the time to buy, knowing that his judgment will be the measure of his success.' On the other hand, the incentive or need for overselling is removed and the manufacturer allots and distributes tonnage intelligently and in keeping with his known capacity."

The Vogt Bros. Mfg. Co., Louisville, Ky., has given a 9-hr. day to its 200 employees.

A NOTABLE LABORATORY

Up-to-Date Investigating Facilities of the Youngstown Sheet & Tube Co.

The laboratory recently completed by The Youngstown Sheet & Tube Co. was built to provide for the departments of metallurgy, chemistry, inspection and research. As the work of each is more or less dependent upon the others it was decided to house the four departments in the one building.

The building is of three floors, U-shaped, having a frontage of 115 ft., and the wings 88 ft. deep. The court between the wings is 30 ft. wide by 40 ft. deep. Fireproof construction is used throughout. Each floor is self-supporting, a combination of wall bearing and column construction being used.

The walls and partitions are of brick and hollow tile. The exterior walls are buff brick trimmed with terra cotta and stone. The floor and roof slabs are of reinforced concrete. The finish of the floors is of material suited to the work done in each room; thus, all office rooms have maple floors; halls, corridors, toilet and locker rooms are of terrazza construction; storage rooms are of concrete or asphaltum; machine shop and heat treating room, the physical testing laboratory, and the test drilling room have wood block floors; all chemical laboratories, acid storage and cement testing rooms are provided with an asphaltum floor.

On the first floor of the building are located the experimental, physical and cement testing laboratories; two office rooms; apparatus, acid, and general storage rooms; and fan, air tempering and electric power control rooms.

On the second floor are the offices of the chief inspector; his assistant clerks and stenographer; the offices of the metallurgist, his assistant, clerks, and stenographer. The machine shop and heat treating room for preparing specimens for physical testing or microscopic examination are on this floor. Adjoining the office suite of the metallurgist are the following: microscopic, polishing and dark rooms; corrosion testing calibration and locker, toilet and shower bath rooms.

The equipment of the metallurgical department includes a 400,000-lb. hydraulic, a 150,000-lb. and a 100,000-lb. screw-driven testing machine, hardness and ductility testing machines and a heavy duty specimen milling machine in the physical testing laboratory. An experimental open-hearth furnace is being designed for use in the research laboratory. The machine shop and heat treating room contains a lathe, shaper, small milling machine, drill press, hack saw and a tool grinder; also two electric and two gas fired heat treating furnaces equipped with rare metal pyrometers. The microscopic laboratory contains a complete metallographic outfit, a small hood, and the necessary tables and cabinets. In the polishing room are a vertical polishing motor, cabinets for storage of samples and supplies, and a soapstone table and sink.

All workrooms of this department are equipped with hot water, cold water, gas, compressed air, and alternating and direct power lines.

The third floor is occupied by the chemical department. On this floor are two office rooms and the following laboratories: Iron and steel, raw material, bacteria, water, solution, electrolytic, by-product, calorimetric and gas. Adjoining the office of the chief chemist is a private laboratory. All rooms are equipped so that they may be used for any analytical or chemical testing work by changing the movable apparatus. In the large rooms each hood is equipped with the gas, electric power, compressed air, vacuum, and high pressure steam services and each table with hot water, cold water, electric power and vacuum lines.

The asphaltum floors of the chemical laboratories are composed of Trinidad asphalt with crushed silica rock aggregate. The walls and ceilings are tile. All wood trim is golden oak. The table tops are birch, finished in acid-proof black; the hood bases and sinks are soapstone. The acid drains from the sinks and the floor drains are glazed tile, the joints of which are packed with a kaolin and asphalt mixture.

The building is heated by direct radiation, using low pressure steam. The chemical laboratories are supplied with tempered air from a motor-driven fan located on the first floor and the ventilation of these rooms is completed by exhaust fans in pent houses on the roof of the building.

Attention may be called to the following features: Tunnels inside the foundation walls connecting with vertical shafts for all service lines. The walls and ceilings are of tiling. Distilled water is obtainable in each wing of the building. A totally indirect lighting system is used, a pneumatic tube system connects a central test drilling station in the mill with the iron and steel laboratory, and a telautograph system is employed to report analyses to the blast furnace, bessemer, open-hearth, rolling, metallurgical and shipping departments. Control laboratories are maintained at the two Hubbard blast furnaces at Hubbard, Ohio, and also at the by-product coke and benzol plants.

A view of the laboratory building and its proximity to the large new office building of the Youngstown Sheet & Tube Co., both notable structures across the Mahoning River from the steel plant, were shown in THE IRON AGE of Jan. 4, 1917.

A Corner of One of the Three Floors

Future Practice in Making Coke

Discussing "Some Future Lines of Advance in Coking Practice" before the annual meeting recently of the Yorkshire Section of the Society of Chemical Industry (British), G. E. Foxwell, Sheffield, pointed out the necessity for shortening the carbonizing period in order to increase the output, and argued that coke-oven bricks, as at present used in England, are far from satisfactory. Apart from improvements in the coking process, great advances are possible in the recovery of by-products. For instance, a method is wanted which will permit of ammonia recovery as sulphate, using the sulphur contained in the coal to provide the necessary sulphuric acid. Naphthalene is another compound, the paper showed, which has been neglected.

The present system of recovering 65 per cent benzol is not the one calculated to give the best results, the author continued. It is found in practice that by manufacturing benzol of 55 per cent strength there is a very considerable increase in the amount of toluene recovered. It seems preferable, therefore, to recover benzol of much lower strength than at present and to wash it for phenol. It would be very advantageous also if a system could be found whereby the carbon disulphide could be recovered from the gas before taking out the benzol. Other points brought out were the following:

In all probability the coke-oven plant of the future will not stop at the recovery of crude 65 per cent benzol, or washed 90 per cent benzol. It will manufacture pure benzene, toluene, and xylene, probably also nitrobenzene, nitrotoluene, aniline, toluidine, and possibly pure naphthalene. The manufacture of the raw material for dyes will be more rationally carried out at coking plants than at the dye-works. If coke-oven plants would undertake the manufacture of these raw materials, it would leave the manufacturers of dyes more opportunity for concentrating on the production of colors. The surplus gas evolved from by-product regenerative coke ovens is equivalent to over 1,000,000 tons of coal per annum. In a great number of cases this gas is allowed to burn at a blow-off pipe in order to get rid of it. It should be possible to transfer this gas to neighboring towns by means of high-pressure mains, as is done in the case of natural gas in the United States.

Will Be No Strike of Coal Miners

WASHINGTON, June 19, 1917.—There will be no shortage of coal during the coming year if the miners can prevent. As the result of an agreement reached at a conference held here June 15 between the officials of the United Mine Workers of America and the coal committee of the Council of National Defense, 1,000,000 tons will be produced before July 1, 1918. Recognition of the union by the Council of National Defense on a par with that accorded the mine operators has been promised and the following members have been added to the committee on coal production: J. S. White, president; John Mitchell and Frank J. Hayes, vice-presidents, and John L. Lewis, chief statistician, of the United Mine Workers of America; James Lord, president of the mining department of the American Federation of Labor, and James Kerwin, secretary to Secretary of Labor Wilson.

The result of the conference with the coal miners here will be twofold. It will prevent the strike which threatened to tie up the commerce of the country and it will place in charge of the mining of coal a committee of the Council of National Defense representing every element entering into coal production, thus insuring an output adequate not only to the needs of this country but also to those of the Allies.

Secretary Daniels announces that the producers of coal and also of petroleum have been ordered to supply large quantities needed by the Navy at prices to be fixed hereafter by the President, based on rates determined by the Federal Trade Commission to be fair. It is estimated that the Navy, under this arrangement, will purchase 1,750,000 tons of coal and 50,000,000 barrels of oil.

American and German Steel After the War

Reviewing the probable relative positions of the American and European steel industries after the war, Dr. Felix Pinner, in an article in the *Berliner Tageblatt*, as given by the London *Ironmonger*, has this to say:

"Previous to the war the costs of production of primary and semi-finished iron products were about the same in America and in Germany. Since then the cost of production and the selling prices have risen enormously in both countries. The rise in prices has been greater in the United States than in Germany, but it would be rash to conclude that the same applies to the costs of production. And so far as the future is concerned, it is probable that the costs of production will be permanently increased in Germany, as well as in Great Britain, Belgium, France and Russia, in a far higher degree than in the United States. For although the United States has now come into the war, it has been piling up money for nearly three years, while the others have been laying up debts which must very heavily burden their industries. The sooner the war comes to an end, the greater will be the difference in favor of America in this matter. It is to be expected, therefore, that after the war the United States will be a greater factor in the markets of the world than it was and that it will remain so. Against this, however, has to be remembered that wages have risen much more in America than in Germany, and that this increase may outweigh American advantages in other matters, in particular when it comes to the most highly finished products, where the cost of labor is the chief item in the price. It is thus particularly gratifying that during the war German industry has to a large extent been converted from the production of raw and semi-finished products into a highly specialized one and also that most of the manufacturers have built up great reserves of capital out of their war profits. The main thing to be done as soon as peace comes again will be to restore the financial credit of Germany abroad."

Tar Varnish for Iron Work

A tar varnish for iron work is recommended by a South African correspondent of a British trade paper, the prescription being as follows:

> Heat about 100 gallons of tar to a low boiling point, and add 100 lb. of fresh slacked lime sifted over the top and then worked down. Boil this mixture until it becomes pasty. Let it settle for a few minutes, and then add 20 lb. of tallow and 5 lb. of powdered resin. Stir until thoroughly mixed and all ingredients dissolved; then allow to cool. The mixture should not be raised to a higher temperature than 100 deg. Fahr. Should the preparation be too thick it can be thinned down with paraffin or naphtha.

This gives a finish like stove enamel. The writer's works are on the edge of the sea and the southeast winds eat away ironwork very quickly. All gas holders and galvanized iron roofs and galvanized sides of buildings are painted two coats with this tar varnish and then whitewashed, thoroughly protecting them from the weather and salt air, he reports. The varnish is elastic and will stop corrosion. A similar mixture was used for coating the girders of all the bridges on a railroad in the North of England with good results.

A Pressed Steel Truck Wheel for Heavy Duty

The W. J. Clark Co., Salem, Ohio, has brought out a pressed steel wheel for medium and heavy duty. It is of the same general construction as the lighter types of this company, which were illustrated in THE IRON AGE, March 18 and Nov. 18, 1915, but is designed however for a wrought steel tire instead of the rubber one employed with the earlier wheels. This last wheel has an outwardly projecting peripheral flange to which the tire is attached and is provided with either a plain bearing consisting of a hollow spindle with locknuts or a ball bearing, both of which are renewable. All standard diameters of wheels from 2 to 30 in. can be supplied.

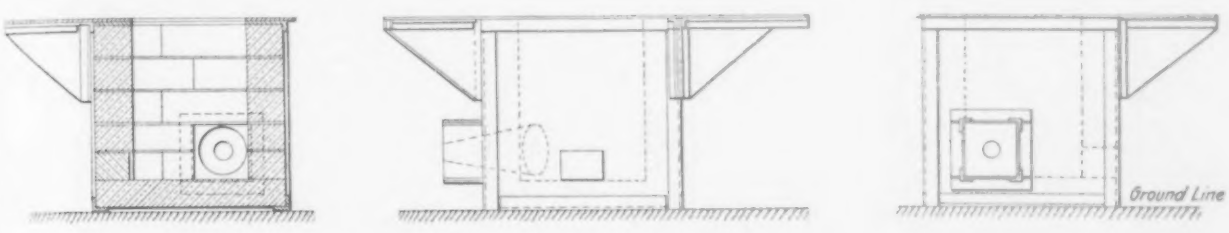
CRUDE-OIL MELTING FURNACE*

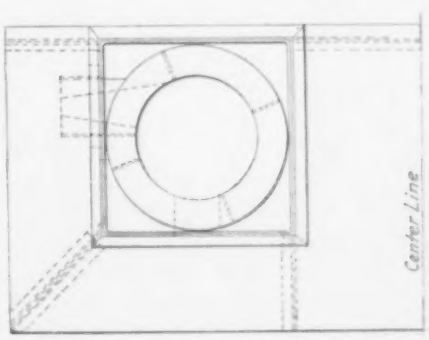
A Simply Constructed Fixed Unit for the Rapid Production of Brass

The chief difficulty with fixed or tilting furnaces of the oil-fired type has been to retain or obtain the services of sufficiently skilled workers to operate the larger sizes who can maintain uniformly good results both in the composition and strength of the castings and billets produced. The illustrations herewith show a simple and efficient type of fixed oil furnace designed for the rapid production of various grades of brass. It permits the use of unskilled labor throughout in its operation.

The outer shell or casing is made of steel plates bolted together to form a rectangular box, the height of which may be varied for large or small crucibles. The lining is of ordinary firebrick set in ganister to leave a circular opening, the corners between the lining and the casing being packed with sand as an insulating material. The top of the furnace consists of two cast-iron plates resting on the top ring of firebrick and leaving a circular opening over which the furnace cover is placed during melting. The cover consists of a circular flat firebrick with a conveniently small aperture in the center, and bound with iron.

It has been found that the best arrangement is to have the whole furnace above the floor level, so that no pit or special foundation is necessary, and flues also are unnecessary. In the event of a crucible cracking in the furnace while full of molten metal, there is no difficulty in removing the spilled metal through the front opening, which is usually, in working, kept closed by luting in a firebrick.





Arrangement of Metal Melting Furnace Using Crude Oil

The shape of the special burner brick allows the oil spray to spread out in a conical fashion, and, igniting on entering the furnace with a tangential motion, it causes the flame to sweep round in the annular space between the furnace walls and the crucible before passing out at the central opening in the firebrick cover. By using a single burner brick of the required shape and also by having the firebrick slab for the floor of the furnace in one piece, there is no chance of leakage or escape of unconsumed oil.

The form of oil burner depends upon the type of air-pressure plant installed. Where compressed air is already in use it must be reduced in the foundry to not more than 25 lb. per sq. in. effective pressure at the burner valve. The burner must then be of the special high-pressure design, which is found to be exceedingly effective in producing the necessary pulverizing action on the heaviest types of crude oil. As low a consumption as 1.5 gal. for each 100-lb. of brass melted can be consistently maintained. The slightly increased cutting action of the high-pressure burner flame, both on the furnace lining, where carbonization is likely to result, and on the crucibles themselves, makes the extreme saving of oil a questionable advantage in view of the short life of the crucibles and the more frequent patching required for the furnace lining.

Most satisfactory results have been obtained with the use of low-pressure burners, which can be used in cases where no high-pressure air system is in use. Small, high-speed electric fans capable of producing about 12 oz. air pressure (i.e., from 20 to 22 in. of water) can be readily employed to work four furnaces simultaneously. The only precaution to be taken in such a case is that the furnaces should be started up from cold not more than two at a time, and those which are not immediately in use at any period can have the air supply cut off separately.

The consumption in this method of working is slightly more than 2 gal. per 100 lb. of metal melted, but this is offset by the advantage of being able to melt with perfect regularity against time, as not more than 35 min. is required to melt completely and pour 100 lb. of brass. But 50 to 55 min. is required for 200-lb. charges.

In addition to the advantage of being completely operated by unskilled labor, these furnaces have the obvious one of being easily removable, as they can be set down anywhere on a reasonably smooth floor. They are constantly under the most complete control, simply by regulating the air and oil inlet valves. Their first cost is low and repairs are a small item in their running. They are less destructive on crucibles than the various forms of gas flame employed in melting furnaces. Clinkering, as with coke firing, is completely done away with.

With 100-lb. pots there is no difficulty in withdrawing the crucible full of molten metal by hand, but when 200-lb. pots are used it is advisable to resort to a mechanical aid such as the quadrant lifting arm, with a chain to hook on to the basket lifting tongs.

In a properly organized brass foundry all mixtures are controlled by analysis, and the charges accurately weighed out, after briquetting, if necessary. In this way it is quite feasible to do without any fresh copper. Complete returns are kept of the work and output of each shift, and these may be abstracted for each grade of metal made. The following table represents one month's output of "G" metal only:

Metals melted:	Lb.
Zinc	65,920
Cartridge cases	349,813
Swarf	709,218
Scrap	357,549
Total	1,482,500

	Lb.
Flux used	7,412
Aluminum deoxidizer	920

Foundry production: Number of melts 14,825 of 100 lb.

	Lb.
Billets produced, 124,855 =	1,312,225
Scrap and spilled metal	26,539
Metallic shot recovered from foundry dross	73,920
Total	1,412,684

Melting loss = 1,482,500 — 1,412,684 = 69,816 lb. = 4.7 per cent.

Number of furnaces working, 18 to 22.
Total oil consumed, 32,599 gal.
Oil consumed per 100 lb. of metal melted, 2.2 gal.

The amount returned as loss is somewhat in excess of its actual value, as the weight of metallic shot recovered, 33 tons, represents an average of only 60 per cent of the total dross produced and treated by simple washing. Further treatment by concentrator revealed nearly 30 per cent more metal to be obtained.

*From a paper read before the Institute of Metals (Great Britain), March 22, 1917, by H. S. Primrose.

HISTORY OF THE OPEN HEARTH

S. T. Wellman Tells of Its First Success—Cleveland Society Confers Honors

At the thirty-seventh annual banquet of the Cleveland Engineering Society held Tuesday evening, June 12, Samuel T. Wellman and Ambrose Swasey were made honorary members. These gentlemen were born in New Hampshire only 30 miles apart, are within three months of being the same age, both have been president of the Cleveland Engineering Society and of the American Society of Mechanical Engineers and they have been neighbors in Cleveland for many years.

Mr. Swasey spoke briefly, expressing his appreciation of the honor conferred upon him, paying a high tribute to Mr. Wellman and referring to the great part that the engineer is taking in the war.

Mr. Wellman was unable to attend on account of illness, but sent a letter in which he gave some very interesting history in connection with the development of the steel business. After expressing his appreciation of the honor conferred upon him and stating that it was just 50 years since he left his home in New Hampshire and started for Pittsburgh to get his first insight into the steel business, Mr. Wellman said:

Perhaps the story of my leaving home at that time might be interesting. My father was superintendent of a small iron works among the hills of New Hampshire, which among other business included the rolling of steel locomotive tires which they made from hammered steel blooms imported from England. To properly heat these blooms, they had arranged with C. W. Siemens to build a regenerative gas furnace. The drawings were sent over and turned over to me, who had never seen a drawing of that kind before. My father asked me if I thought I could build the furnace and have it exactly like the drawings. After studying them over a little while, I told him that I thought I was equal to the task. He told me to get the furnace built at the earliest possible moment. I had just finished the furnace and had a drying-out fire in it when a big black-whiskered Englishman walked into the office and announced that he was the Siemens engineer who had been sent from England to build this particular furnace. My father turned him over to me to go out into the works and show him where the furnace was to be located, which I did, and my English friend was very much amazed to find the furnace all finished. He was pleased as well, and said, "Why, we have only to start the furnace now; you have made a proper job of building it." So everything else being ready, we started up the gas producers and the furnace and everything worked to perfection. The engineer was so pleased with what I had done that when he left he asked me to go with him to Pittsburgh as his assistant in the starting of a crucible steel melting furnace which was finished and waiting for him to start. It is needless to say that I did not have to have a second invitation, but went to Pittsburgh with him. This was in 1867, and I spent over a year there. The first few months of that time were spent starting up and operating the first crucible steel melting furnace built in America, at the works of Anderson, Cook & Co. To show what a tremendous saving this furnace was over the old coke-fired furnaces, I will only say that it melted a ton of steel with an average of 1000 lb. of nut coal which cost less than $1, while to melt a ton of steel in crucibles in the old-fashioned coke furnaces took three tons of the very best coke, costing anywhere from $2 to $10 per ton. This style of furnace was a great success and in a very few years had driven the coke furnace out of use.

From Anderson, Cook & Co. I went to Singer, Nimick & Co.'s works, where I built two crucible steel melting furnaces of the same type as the one which I went to Pittsburgh to start. After that I spent some time in the office of the Siemens agents in Boston, and also at steel works in different parts of the country starting crucible steel furnaces of the same type. I then built a crucible steel melting furnace at the Chrome Steel Works in Brooklyn, N. Y., which was a success. From there I went to the Bay State Iron Works, in South Boston, Mass. (I having separated myself from the agents of the Siemens furnace some time before this), where I built the first open hearth furnace that was a commercial success in the United States. This was a pronounced success in a great many ways, making a quality of steel which up to that time had not been reached in this country. The principal use to which it was put at that time was in the manufacture of locomotive fireboxes. From there I went back to the old works in New Hampshire where my father was still superintendent, and built for them an open hearth furnace, a plate rolling and bar rolling mill.

I then came to Cleveland in 1873 to design and build the Otis Steel Works, with which I was connected as engineer and superintendent for 16 years. It is useless for me to say very much about the history of the Otis Steel Co., as it is too well known here. But there are two inventions which I worked out during the time I was connected with the Otis company that are today absolutely indispensable to the economic operation of any open hearth steel works. I refer to the open hearth charging machine and the use of the electro-magnet for handling pig iron and scrap steel. Just a few figures will give you a little idea of their importance to the trade and what they are saving every day.

There were made in this country in 1916 approximately 39,000,000 tons of pig iron and about the same quantity of steel ingots of all kinds. Very conservative figures show that at least half of this, or say 20,000,000 tons, was pig iron and scrap handled and used in open hearth furnaces. This was all handled by the open hearth charging machine and electro-magnet at least once, the bulk of it twice, and a great deal of it three times. By the use of the electric open hearth charging machine, the direct saving in labor is estimated by one of the large users at 25 cents per ton. This was about 10 years ago, and of course labor is much higher today. At the same time he estimated the indirect saving in handling of the material charged into the open hearth furnace (calling it only 20,000,000 tons) of $10,000,000. If we go back 17 years, this saving amounts to not less than $85,000,000. This is a big sum of money, but the estimate is far below the maximum amount which has been actually saved. The saving in labor by the use of the electro-magnet in the United States per year at the rate pig iron and scrap are being handled today is not less than $1,500,000. We can very safely say that in the last ten years at least five times that amount, or the sum of $7,500,000, has been saved; or a total for both of these inventions of nearly $100,000,000,—a saving of which any inventor might well be proud. Every open hearth plant of any size in the world today is equipped with these inventions, and they are considered as much a necessary part of the equipment as the furnace itself.

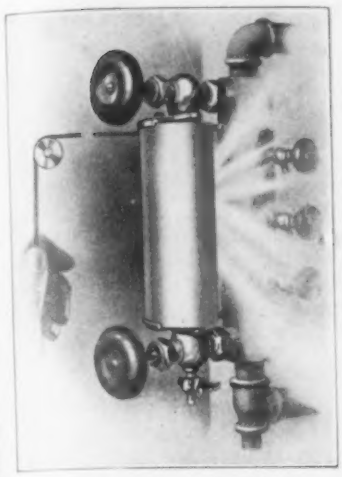
Canada's Pig Iron Production

The Mines Branch of the Department of Mines, Ottawa, Canada, has received from the producers complete returns of the production of pig iron in Canada, and with the exemption of three small plants, complete returns of the production of steel ingots and castings during the first three months of 1917. The total production of pig iron during the first three months was 276,777 short tons, or an average monthly production 92,259 tons, as against an average monthly production of throughout 1916 of 97,438 tons. Furnaces were in blast at Sydney and North Sydney, N. S.; Hamilton, Port Colborne and Sault Ste. Marie, Ont., and a small electric furnace was operated at Orillia, Ont., producing pig iron from scrap steel. The blast furnace at Deseronto, Ont., was idle throughout the period. The total production of steel ingots and castings during the three months was 403,880 short tons, or an average monthly production of 134,627 tons, as against a monthly production of 106,268 tons during 1916.

Kraeuter & Co., Inc., 563 Eighteenth Avenue, Newark, N. J., are spending $160,000 in new plants and equipment for the manufacture of tools, such as pliers, chisels, wrenches and special tools for machinists and automobiles. Four new buildings are being erected on a site nearly one mile from the present plant, the new location having been selected because of better shipping advantages. The new buildings are a tool and die room, two stories, of saw-tooth construction, 54 x 150 ft.; a forge shop, 50 ft. high, 54 x 240 ft.; a boiler house which will house two boilers of 225 h.p. each, and a pickling department, 20 x 80 ft., one story. All of the new machine tools and other equipment have been purchased.

Shield for Broken Water Gage Glasses

A guard designed to remove the danger encountered in renewing broken water gage glasses has been brought out by the Simplex Safety Boiler Gauge Glass Company, Springfield, Mass. When not used to protect the fireman the guard serves as a reflector, thus making it easy to read the water level from any position.



A Semi-Cylindrical Sheet Metal Shutter Is Employed to Deflect the Steam Escaping from a Broken Gage Glass So That the Valves Can Be Shut Off Safely

The guard consists of a semi-cylindrical sheet metal shutter traveling in two circular tracks that can be mounted on the gage rod brackets. The tracks, which are placed one at the top and the other at the bottom of the water gage, are concentric with the glass and are fastened in place by screws. The only other member of the device is a piece of lamp cord which is attached to the shutter, passes through an eye on the outer periphery of the upper track and extends to a convenient location for the fireman.

When a gage glass breaks a pull on the cord rotates the shutter through a semi-circle, as shown. Another quarter turn removes the shutter from the tracks and it drops out of the way sufficiently to enable the fireman to renew the broken glass.

Important Change of Methods of English Machine-Tool Makers

According to advices from Consul Ingram at Bradford, England, a drastic change in the methods of the English machine-tool makers has been brought about recently. Ten machine-tool concerns are said to have arranged among themselves that each shall devote itself to the production of one type of machine. One will confine itself to drilling machines, another to boring machines and so on. Such a policy, it is held, will permit the manufacturers to concentrate all of their efforts and talent upon their individual products, and will place the production of machine tools on a manufacturing instead of on a "jobbing order" basis.

This arrangement will also lend itself to the formation of group selling agencies and travelers, both at home and abroad. The carrying on of foreign trade through the medium of independent general agents has on the whole proved far from satisfactory, but hitherto the majority of machine-tool builders have had to remain content with that method for the reason that their turnover was not large enough to justify the expense of sending a special agent to the leading foreign centers, much less of keeping one there permanently. It has not been easy for a group of manufacturers that were all competitors in certain products to combine for the establishment of joint foreign agencies.

"Under the system of specialization by group compact," says the consular report, "these difficulties disappear, and it is understood that the better organization of foreign publicity and sale is one of the chief objects of the new project."

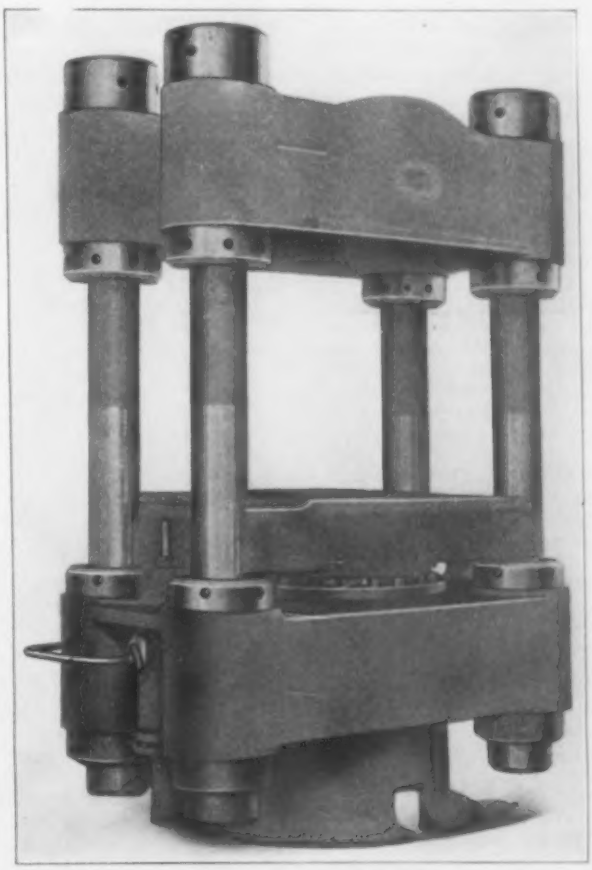
Senator N. W. Currie and W. W. Butler, president and vice-president, respectively, of the Canadian Car & Foundry Co. of Montreal, are in Ottawa discussing with the Government a contract for cars which will involve an expenditure of $13,000,000. The proposed contract calls for 5000 cars at a price of $2,600 each.

A 1000-Ton Hydraulic Forming Press

For steel plate and sheet forming operations the Hydraulic Press Mfg. Co., Mount Gilead, Ohio, has designed and built a 1000-ton hydraulic metal forming press. The construction is very sturdy, a large factor of safety being allowed in the design for the heavy pressure exerted. Either an independent pump or an accumulator system can be used for operating the press, which is equipped with auxiliary push cylinders to accelerate the return of the platen and ram after the pressing operation is complete. The daylight space of the press is adjustable from a minimum of 18 in. to a maximum of 36 in.

The construction of the press in general follows the conventional lines, and the strain rods are threaded to provide for the adjustment of the daylight space. The upper ends of the strain rods are fitted with forged nuts, while the lower ends of the rods have solid heads and split collars. Both sets of collars are threaded, the upper ones serving to permit the head to be lowered and being relied upon to take up all clearance so that the head can be set perfectly true for close work. The lower collars are threaded for taking up clearance.

Two auxiliary push cylinders are provided to hasten the return of the press platen and ram when the pressing operation is completed. Differential rams are provided for the cylinders and are smaller at the upper end than at the lower. This arrangement provides a shoulder on the rams in the cylinders and also, it is emphasized, forms an area to take the water pressure for forcing the rams homeward. The pressure may be allowed to remain on these auxiliary cylinders or double acting operating valves can be employed.



A Hydraulic Press for Forming Articles from Steel Plates and Sheets Not Exceeding 42 x 48 In. in Area Which Exerts a Pressure of 1000 Tons

The Society of Automotive Engineers announces that there will be no difficulty in obtaining all of the motor trucks necessary for the new army which is to be raised. Seventy-three truck makers who submitted bids to the Government in Chicago last week pledged that they could produce more than 100,000 trucks within a year. It is estimated that not more than 42,000 trucks will be required for the first army.

Government Ready to Take Steel Ships

General Goethals Says Yards Will Not Be Taken If Work Is Hastened—Danger of Strike Causes Uneasiness—Patents of Enemies May Be Used

WASHINGTON, June 19.—The war budget bill appropriating the huge sum of $3,381,000,000 was signed by the President June 15, and before the ink was dry the Shipping Board announced that plans had been made to take over approximately 2,000,000 tons of steel ships now in process of construction, chiefly for foreign account, in American yards. The approval of the budget by the President relieves a situation that threatened disaster to many manufacturers and dealers inasmuch as the War and Navy departments had anticipated the passage of the bill by tentative emergency contracts calling for immediate deliveries and aggregating not less than $500,000,000. Payments of these contracts will now be made as rapidly as the accounts can be adjusted and the military authorities will proceed at once with the purchase of all the war material included in the estimates upon which the big budget is based.

The provisions of the budget bill regarding the Shipping Board were recast by the conference committee, but no change was made in the appropriations, which amount to $405,000,000 together with an authorization to anticipate further expenditures of $350,000,000 to be appropriated next December. The section of the bill defining the powers of the President to commandeer shipyards, vessels and material of all kinds was carefully worked out in conference and as the measure becomes a law provides as follows:

The President is hereby authorized and empowered, within the limits of the amounts herein authorized—(a) to place an order with any person for such ships or material as the necessities of the Government, to be determined by the President, may require during the period of the war and which are of the nature, kind, and quantity usually produced or capable of being produced by such person; (b) to modify, suspend, cancel, or requisition any existing or future contract for the building, production, or purchase of ships or material; (c) to require the owner or occupier of any plant in which ships or materials are built or produced to place at the disposal of the United States the whole or any part of the output of such plant, to deliver such output or part thereof in such quantities and at such times as may be specified in the order; (d) to requisition and take over for use or operation by the United States any plant, or any part thereof without taking possession of the entire plant, whether the United States has or has not any contract or agreement with the owner or occupier of such plant; (e) to purchase, requisition, or take over the title to or the possession of, for use or operation by the United States, any ship now constructed or in the process of construction or hereafter constructed, or any part thereof, or charter of such ship.

Will Hasten Work on Vessels

Immediately after the signing of the budget bill by the President, General Goethals, at a conference of representatives of the leading steel shipbuilding concerns held here at his invitation, announced that the Government would at once take over practically all the steel merchant shipping now under construction in American yards. These vessels will be hastened to completion by the institution of a system of double and triple working shifts and as rapidly as the ways are cleared the Emergency Fleet Corporation will begin the construction of its own steel vessels on standardized designs. General Goethals, at the conference referred to, told the shipbuilders that he was confident that, in addition to completing the construction now in progress, at least 3,000,000 tons of steel ships could be built within the next 18 months. If these plans are carried through, the American merchant marine will be increased by not less than 60 per cent in tonnage and fully 85 per cent in transportation efficiency before Dec. 31, 1918.

The British Government, which was consulted before the decision of the Shipping Board was reached, has agreed to turn over to the United States all the vessels now being built in American yards for British account. While accurate statistics are not available, it is roughly estimated that these contracts aggregate about 800,000 tons. As rapidly as these vessels are completed, they will be chartered by the Shipping Board to private operators, but it is possible that a considerable amount of tonnage will be leased to the British and French governments, the former to have the preference because of priority of interest in the ships.

Will Not Take Over Yards

General Goethals is authority for the statement that the Government at this time has no intention of taking over the shipyards "if the shipbuilders exert their utmost efforts to speed construction." The representatives of the shipbuilders who conferred here June 15 gave assurances they would do everything in their power to expedite the building of ships for the board and in all cases would give Government orders the preference. The subject of materials was discussed briefly at the conference and while General Goethals made no positive statement, he intimated that the Government would recognize the extent to which the iron and steel market has risen since Secretary Daniels made his agreement with the steel producers for shapes and plates for new naval vessels and that $90 per ton did not appear to be an unreasonable figure. The representatives of Puget Sound shipyards informed General Goethals that lack of steel is keeping some of their ship-ways idle, and both General Goethals and Chairman Denman promised to take steps to obtain the necessary material at the earliest practicable date.

Danger of a Big Strike

The possibility of a big strike involving all skilled labor in the shipbuilding industry is causing considerable uneasiness here. The leading Pacific Coast yards are operating under the open-shop plan, while in the East ship-workers have refused to work in any but thoroughly unionized plants. The representatives of both classes of yards have appealed to the Government to take hold of the labor problem and to establish conditions of employment that will not involve the abandonment of the principles underlying the existing organizations. The Shipping Board is very reluctant to interfere, Chairman Denman especially declaring that it would be most unwise "to start a labor controversy in Congress at this time" by seeking legislation that would enable the board to draft labor. General Goethals is confident that the labor situation will not seriously interfere with the work on the vessels of the Emergency Fleet Corporation and appears to be less concerned regarding controversies than as to the supply of skilled labor to enable the yards to run two or three shifts.

Serious opposition has developed in Congress to the Administration's bill authorizing the President to direct shipments by interstate carriers and to require the railroads to give preference to certain articles in accordance with the needs of the Government or of the people in any emergency growing out of the war. The Administration leaders in both houses are apprehensive that the bill cannot be passed in its present form and are contemplating a revision under the terms of which the President will still be enabled to exercise extraordinary powers should an emergency arise, leaving the railroads to be supervised by the Interstate Commerce Commission under all ordinary conditions.

"Trading With the Enemy" Bill

The House Committee on Interstate and Foreign Commerce, by unanimous vote, has reported the Ad

ministration's "trading with the enemy" bill and its early consideration is being arranged for. The measure penalizes by heavy fine and imprisonment trading with the enemy or enemy ally. It also provides for the administration of property belonging to enemy aliens where it may be necessary and authorizes the use of patents owned by enemies. The last mentioned provision of this bill has caused considerable anxiety among the responsible officials of several of the largest manufacturing corporations in the United States, whose products are covered by patents taken out both here and in Germany. Representatives of these concerns are in Washington urging that great care be used in framing this legislation not to make it so drastic as to incite the German Government to reprisals.

The Senate and House leaders, however, express the opinion that the American Government can take no middle ground in this matter and that in all probability the German Government will commandeer all American owned German patents that may be of value for military purposes even if all American owned patents are not confiscated. The opinion is expressed, however, that in view of the great preponderance of German owned American patents as compared with American owned German patents the Teutonic allies will hesitate to employ drastic methods by way of reprisal and it is suggested that if American patent owners suffer financial loss as the result of the seizure of their patents they may be reimbursed hereafter as the result of the confiscation and sale of German patents. It seems more than probable that whatever war measures are taken with regard to patents, all Americans who suffer loss will be fully compensated after the war is over, possibly through the interposition of an international commission to be authorized by the peace treaties.

Government-Owned Cars

Fairfax Harrison, president of the Southern Railway System and chairman of the railroads' war board, has authorized the following statement concerning the attitude of the railroads of the country on the proposition that the Government shall purchase 100,000 cars and lease them to the roads:

If the Government shall elect to invest the capital necessary for the acquisition of 50,000 to 75,000 cars, the railroads will be glad to make use of them on substantially the same basis as other privately owned cars are used, namely, a fair payment for mileage made by such cars, the railroads to pay current repairs and the Government to pay owners' repairs under master car builders' rules.

The average addition of freight equipment on American railroads has been at least 150,000 cars per annum. Under existing high prices, and with the inability of car builders to get material, it is unlikely that American railroads will be able to order and secure as many as 150,000 cars during the next year, although they have about 100,000 cars still undelivered on back orders.

Under these conditions the railroads will welcome any addition to their stock of equipment, assuming the standards to be safe and adequate, which would tend to make up the deficiency in their own orders.

It is perhaps expedient that an option should be given to the railroads to acquire these cars at a fair price to be agreed upon hereafter in the proportion of the amount of equipment owned by each railroad to the entire freight equipment of the country.

In expressing the above opinion the railroads' war board has not discussed the merits of the question of whether the largest effective aid in the interest of the public can be given to the railroads by providing additional locomotives and terminal facilities.

A board of officers has been appointed to test and report upon the suitability of rolling kitchens for the United States army. These kitchens are now being manufactured at Jeffersonville, Ind. A consignment has been shipped to Washington Barracks to be tested by the board, which is composed of Capt. Will H. Point, Quartermaster Corps; Capt. William N. Hughes, Jr., and Capt. Campbell B. Hodges, General Staff.

In accordance with an executive order issued by the President, the War Department will hereafter be permitted to employ as inspectors all the experts composing the inspection staffs now or heretofore employed by the British, French, Russian or Italian governments in munitions factories of the United States, including subjects of those countries allied with the United States in the war. The Civil Service Commission is authorized by the President to permit such employment on the requisition of the War Department, but must require the filing of complete data as to nationality, character of work, rate of pay, etc. W. L. C.

Progress in Adoption of Boiler Code

The A. S. M. E. Boiler Code, the code on the construction of steam boilers drawn up by the American Society of Mechanical Engineers, has been adopted or is in porcess of adoption in New York, New Jersey, Pennsylvana, Ohio, Indiana, Michigan, Wisconsin, Minnesota and California, and in the cities of Kansas City, Mo., and St. Louis. The legal adoption of the code failed in Washington, Oregon, Texas, Tennessee, Rhode Island, New Hampshire, South Dakota, Iowa, Utah and Kansas for various reasons, though partly because the campaign of education, large as it has been, needs yet to be continued. According to Thomas E. Durban, chairman, American Uniform Boiler Law Society, one condition which brought about the defeat of the enabling act was the insistence of the Boiler Makers' Union, under the leadership of James J. Casey, that only boiler makers be appointed as inspectors.

In New York the state industrial commission on June 5 adopted the proposed rules for boilers and factories in New York, to take effect July 1, except as to boilers of new construction, when the rules take effect on Jan. 1, 1918. In Minnesota, boilers must be made in accordance with the code on and after Jan. 1, 1918. The adoption of the code by St. Louis and Kansas City is felt as making the way that much easier toward securing recognition by the State of Missouri. In Colorado the new industrial commission will have power to adopt the code, and the society is in correspondence at this time in that connection. A special effort is also being made to have favorable consideration in Canada.

Dayton Pipe Coupling Co. Reorganized

The Dayton Pipe Coupling Co., Dayton, Ohio, has just been reorganized, and W. W. Price has been re-elected president, in charge of manufacturing operations, continuing to have his headquarters in Dayton. Fred W. Miner, vice-president National Supply Co. of Pa., Pittsburgh, has been elected vice-president, in charge of sales, and Charles R. Clapp, secretary and treasurer National Supply Co. of Pa., has been elected secretary and treasurer of the Dayton Pipe Coupling Co., both with headquarters in the Union Bank Building, Pittsburgh. The entire sales and finances of the Dayton Pipe Coupling Co. are now controlled by the National Supply Co. of Pa., Pittsburgh.

Sproul Interests Control

LEBANON, PA., June 18.—State Senator William C. Sproul of Chester, and his associates in the Lebanon Valley Iron & Steel Co., have purchased the Light interests of 7500 shares for an amount said to have been $750,000. These shares were held by H. H. Light, S. P. Light, S. L. Light and J. Warren Light, all of Lebanon, who were the incorporators of the company. Absolute control of the company is now vested in Mr. Sproul and his associates, though Lebanon investors continue to hold some small blocks of stock.

The Imperial Munitions Board, Ottawa, Ont., has authorized the Algoma Steel Corporation, Sault Ste. Marie, Ont., and the Dominion Steel Corporation, Sydney, N. S., to roll 50,000 tons of standard section rails for Canadian railroads that helped the Dominion Government in time of need by sacrificing rails in service for export to the war zone. These roads were unable to secure new rails from American mills. The Canadian rails to be turned out will be distributed among the Canadian Pacific, the Intercolonial, the Grand Trunk and the Temiskaming & Northern Ontario railroads.

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Wooden Ships and Steel Conservation

The action of the Emergency Fleet Corporation in contracting this week for 24 wooden hulls in addition to the 24 wooden hulls and 30 complete wooden ships previously under contract is commendable in so far as it indicates that the building of ships and yet more ships is to have right of way as against any and all disputes over ways and means. The dismissal of two assistants of General Goethals for insubordination is an incident over which no time should now be lost. The President may yet have to decide whether General Goethals or Chairman Denman shall be the official survivor of the hostilities they have waged; but whatever preference onlookers may have concerning that decision will not change their conviction that the supreme duty of the Government is to build ships—steel ships and wooden ships—as fast as material and labor can be had.

One consideration grows in importance as estimates of the probable demands of the Government and its Allies upon the country's steel output have increased. That is that every wooden ship that can be built will relieve by that much the Government pressure upon the steel industry and release steel for the imperative needs of the railroads and other domestic consumers whose continued operation is highly important. No individual preference or prejudice should be allowed to stand in the way of any program that has possibilities of steel conservation. General Goethals' contention that the main dependence must be upon steel will be in no way discredited by further contracts for wooden ships. Every ton of carrying capacity that can be built will be needed and more. To the steel maker a problem of the first magnitude, in which the shipbuilding program is a vital factor, is how the wants of the Allied Governments are to be supplied without crippling the operations of private consumers.

Observers of a recent shift in the control of a British branch of an American company see the hand of active industrial diplomacy. The view is that the different national branches of some of the largest internationally operating companies are splitting up into substantially independent units, each to pursue a specific business field. If more companies follow the same plan, it might indicate an understanding that the different companies will not enter aggressively in competition in the same field. The point is that a company operating as a separate entity in Great Britain, for example, could follow more energetically the plans of the so-called economic conferences held among the allied nations to make it difficult for Germany to get after the war business. Following the same argument, the parent company in the United States would be harassed by a minimum of destructive competition, particularly in working in the Orient.

An Impossible Steel Market

From time to time as this wonderful steel market has developed, stages have been reached at which the observer was disposed to feel that it could not have a future; that there could be no such thing—much in the mental attitude of the countryman who is often quoted as denying the existence of the animal known in more enlightened circles as the giraffe. The reference is not altogether inappropriate as this steel market has shown remarkable facility in reaching out to places, or price levels, hitherto supposed to be unattainable.

The steel market has been covering new ground since the beginning of last year, by which time prices had reached a level equal to that of 1907, which had been generally regarded as the highest "safe" level. It was just at that time that Chairman Gary of the Steel Corporation issued his "stop, look and listen" statement. The atmosphere surrounding the market just before that time is suggested by a short extract from editorial comment on the situation in THE IRON AGE of Dec. 2, 1915: "The steel mills have pursued a course calculated to quiet the steel market eventually, as they have advanced prices very sharply, more rapidly indeed than ever before in the history of the industry, and in many lines they have discontinued entirely the practice of making open contracts for specification later, confining their business to specific orders."

According to precedent this course was calculated to quiet the market, but the calculations went astray. In many cases contracts were made for the first quarter of 1916 and refused for the second quarter, but even with the three months' breathing

stance, the mills did not catch up. The condition resulting was that at the beginning of July the chairman of the Steel Corporation was in position to state that it had about 6,000,000 tons of material on its books actually specified for shipment, the total obligations being a trifle less than 10,000,000 tons. That was the answer of the trade to the attitude of the mills in striving to limit blanket contract obligations.

Repeatedly price advances were made that seemed likely to discourage buying, but apparently they furnished a stimulus instead. The smaller mills, with clearer order books, were obtaining premiums for the early deliveries they were able to make and some of the larger mills felt that a sound course would be to advance prices to the prompt level, let the forward buying die out, and get into the position of being themselves able to make prompt deliveries; but buyers never allowed that condition to come about. Throughout all this experience the Steel Corporation seemed most inclined of the large producers to make commitments for distant deliveries.

Now the mills are reserved about selling to the general trade for a new reason. They expect the Government to place orders for a large part of their output and they cannot see the desirability of selling for delivery at their convenience when the first thing likely to occur is a postponing of the expected time. If buyers should act as they did last year, they would be the more insistent to place orders, and that would give the market a still sharper advancing tendency than it has had hitherto, although practically an impossible market situation has been reached already.

The market would be in the hands of fewer buyers, however, for there are many now who are content to rest upon their purchases already made and let the future solve its problems itself. Yet even the restricted class of buyers may be insistent enough to make a market, seeing how little material is to be available. The first estimate the Government presented to the steel makers was for less than 1,000,000 tons of finished material, or from 2 to 3 per cent of the country's capacity. Now it is indicated that the Government may seek to purchase, for itself and the Entente, steel equal eventually to 40 per cent of the output. Included in this, however, would be the steel formerly exported. Last year steel exported directly and consumed in manufactures exported was between 20 and 25 per cent of the output, a portion of this, possibly as much as a third, being to neutral countries. That portion will probably disappear, so that steel for the Entente could increase somewhat without exports increasing. Nevertheless, the war demands are going to leave much less steel for the regular domestic market.

Crippled business cannot help in winning the great war. D. L. Winchell, director of traffic, Union Pacific System, hit the nail on the head the other day when he said: "The world's war will be won only by prosperous America. Any industry which cannot or is not permitted to increase the selling prices of its wares so as to offset approximately the increased costs of production cannot contribute to the general prosperity." Mr. Winchell had the railroads in mind particularly, but the same truth applies to all lines of business. At the present time, there is a disposition in some quarters to criticise those Government officials who are showing a willingness to pay somewhat higher prices for iron and steel products than 2.50c., Pittsburgh, for shapes and bars, and 2.90c., Pittsburgh, for plates, the prices which the steel companies consented to accept on a considerable tonnage some weeks ago, although even then two to three times higher prices were being paid by other buyers for anything approaching prompt delivery. Undoubtedly there are enough things at Washington to be criticised unfavorably, but the attitude of some Government officials in this matter deserves commendation.

Government Buying of Rolling Stock

At a time when the car shops are refusing to quote on export inquiries because they cannot secure steel and, in some cases, have been reducing working forces for the same reason, the plans being considered at Washington for the Government to purchase freight cars suggest that the question is chiefly one of finding the steel. As a matter of fact the car shops have been operating at only about half capacity for some time past. According to the annual statistics of the *Railway Age Gazette* they did not do materially better than that in 1916, for the reported output of the American and Canadian shops was 135,001 freight cars last year, against such high numbers as 207,684 in 1913, 284,188 in 1907 and 240,503 in 1906. The capacity of the shops in the United States, fully manned and supplied with raw materials and equipment, is probably all of 300,000 cars a year.

The car purchase proposition is formulated in a report by the co-operative Committee on Cars of the Advisory Commission, S. M. Vauclain, chairman, which advocates the purchase by the Government of 100,000 gondolas and 50,000 box cars. Through the Council of National Defense has come the statement that the railroads would welcome the provision of 50,000 or 75,000 cars, but it is suggested that additional motive power or terminal facilities might be even more desirable. Striking an average, the proposition can be discussed in terms of its involving the purchase of say 100,000 cars.

Orders now on books probably total somewhat more than 100,000 cars. The filling of these orders cannot, of course, be delayed to make way for the Government orders, as there is no important distinction between them. If the Government should add 100,000 cars to the orders there would be work at full capacity for about eight months, and it is certainly an alluring prospect to have such a number of cars added to the railroads of the United States, France and Russia, as a considerable part of the business now on books—some of it indefinite as to delivery—is for Russia and France. It would certainly be worth while to make the most strenuous efforts to carry out the program.

The announced plan is that the Government would buy the cars and lease them to the railroads on a per diem basis, until the close of the war, when they would be sold to the railroads at a suitable

price. This plan would not only relieve the burden on the railroads of paying very high prices for cars; it would probably bring about somewhat lower prices for the Government. Also it would offer the important advantage that as it is a war measure and questions of economy deserve scant consideration, the design of the cars could be dictated by the desideratum of speed in construction more than by economy in service. It is not a question of what type would be the most economical in operation over the next 15 or 20 years but what design could be built most quickly and with the least strain upon the plate mills.

Technically there is a locomotive buying program on a par with the car buying program, there being a committee on each, with S. M. Vauclain as chairman of both; but it would appear that the marshaling of locomotive building capacity is an even more difficult problem than that of car building, as the locomotive shops are more nearly filled to their capacity already.

Of course a great deal that is done now will lead to complications when the war is ended. It may not be an easy matter to adjust the sale of the cars to the railroads at that time, and any proposition to continue the leasing system after the war would be unfortunate, unless it were to be recognized that steps toward the eventual ownership of the railroads by the Government were in order, and that is not pleasant to contemplate.

The Manufacturers' Part

A very large part of the credit for the success of the two billion dollar Liberty bond issue is due to the manufacturers of the country, who not only subscribed liberally themselves, but in many cases made it possible for employees to subscribe without any strain. One of the most highly gratifying features was the liberality with which workingmen of foreign birth entered into the spirit of the movement. Some companies displayed considerable ingenuity in the methods adopted to facilitate the placing of the bonds. A Cleveland company, by itself paying the final installment of $2 and crediting the employee with interest, arranged so that the net payments on a $50 bond by the purchaser were only $46.25. A Jersey concern provided for assuming responsibility for any unpaid balance in case of death of the subscriber and agreed to turn over the bond to the estate of the decedent after expiration of the installment period.

The good that will be accomplished by the distribution of bonds among many thousands of workingmen is incalculable. It will make every man feel a deeper interest in the war and will bring his country nearer to him.

Montana is the latest State to report wonderful discoveries of manganese ore. Newspapers tell of great excitement in that State over an alleged marvelous discovery at a mine where already about 1,000,000 tons of this precious ore is in sight. In view of the many exaggerated reports concerning manganese ore that have been circulated in the United States since the war started, this latest news is not likely to excite well-informed people. They will calmly await developments.

BOARD WILL CONTROL EXPORTS

New Body Will Exercise Very Important Functions During War

WASHINGTON, June 19.—Pursuant to the provisions of the so-called espionage law, just approved, the President, at an early date, will appoint an executive board made up of State, War and Navy Department officials to supervise the export trade of the United States during the war. This board will probably be assisted by an advisory committee composed of prominent business men who will serve without remuneration. The State Department will direct the work of the board, which will have charge of all trading with foreign countries. As the board will have both reciprocal and retaliatory powers with reference to our foreign trade, it will exercise an important function in securing the readjustment of foreign embargoes upon goods which we need and may be of material assistance in securing adequate supplies of such articles as ferromanganese, pig tin and other commodities which are now being doled out to the United States by Great Britain. In view of the fact that we now control the food supply of the world and numerous raw materials, like cotton, it will be an easy matter to compel the allied governments and all neutrals to give the fullest consideration to our requirements.

In accordance with an official statement made here, the Government's purpose in applying the new law, aside from preventing supplies from reaching the enemy, will be to conserve all American resources, first, to make America effective in the war, second, to make the Allies effective, and, third, to protect neutrals friendly to the alliance. Attention will also be given to the problem of readjusting shipping routes and sources of supply with a view to making a substantial saving in tonnage by reducing long hauls. As an illustration of what can be done in this direction, it is pointed out that Spain might not be allowed to get American coal if she could just as well get coal from England.

For the time being the export-control chapter is considered by the war trade committee as the most important portion of the new law. That section of the act will not only prove effective in promoting the success of the war by preventing shipments to the enemy, but it will prove a safeguard against the development of another embarrassing situation in the relations with Mexico, since under it shipments of arms and munitions across the border can be absolutely controlled.

W. L. C.

Coke Freights Advanced 15 Cents

WASHINGTON, June 19.—Announcement was made June 15 by the Interstate Commerce Commission that it had authorized the railroads in official classification territory to increase the freight rate on coke 15 cents a ton, the new rate to become effective at midnight of that date. The commission now has before it the proposal of the railroads to increase the freight rate on coal in the same territory 15 cents a ton, the carriers proposing to make the increase effective July 1. These two cases are covered by the application of the carriers for a general increase in freight rates, but they were heard separately by the commission. On other commodities in the general case the railroads are asking an increase in rate of 15 per cent, but on coke the rate was increased 15 cents a ton and the proposal is to make a similar rate on bituminous coal.

Conference at Atlantic City

The sheet and tin plate conference to establish a wage scale for the next fiscal year dating from June 30 began Monday in Atlantic City. The conference of the bar iron manufacturers and the Amalgamated Association representatives will meet at Atlantic City about June 28.

DETROIT PLANTS VERY BUSY

Automobile Companies Will Be Called Upon to Make Airplane Motors

DETROIT, June 19.—Although a drop in production of passenger automobiles of about 30 to 40 per cent is expected as a result of the war, there will be no lack of activity among the larger Detroit automobile plants. The tentative plan of the Government to spend $600,000,000 for airplane construction will require the help of the automobile factories, which, it is expected, will build about 100,000 airplane motors.

The Ford plant has made an astounding record. During its fiscal year ending in August it will have produced approximately 750,000 cars and specifications have been issued looking to an output of 1,000,000 cars during the coming fiscal year. The Ford Motor Co. closes down every year during a part of August and conducts a regular campaign to place its men in temporary jobs elsewhere for this period. This may be the basis for a rumor which has reached here from the East that the Ford company contemplated laying off a considerable number of men. Plans for the Ford tractor plant are being rushed and this will require an additional number of skilled mechanics. The Ford plant was recently running on three shifts, but discontinued one shift because of a lack of expert mechanics. The Ford output is 3100 cars a day and even then buyers are kept waiting six weeks for delivery.

The Cadillac Motor Co. has cancelled the usual two weeks' summer vacation and is producing 100 cars a day, which are not sufficient to meet the demand; an addition is being built. The Dodge plant is producing 450 cars per day and will increase to 500 per day in September. The Buick factory is turning out 750 cars per day. The Studebaker plant has closed for the usual summer inventory and repairs and the Hupp and Chalmers plants will also soon close for the same purpose.

Jones & Laughlin New Blast Furnace Started

No. 6 Eliza blast furnace of the Jones & Laughlin Steel Co., Pittsburgh, which was started on Jan. 15 last, has been completed and put in operation. This is a 500-ton furnace, equipped with three hot blast stoves, the bosh being 22 ft. in diameter and the height of the stack 90 ft. The new furnace was built by the company itself, and no new equipment was needed, there having been sufficient blowing capacity at the Eliza furnaces to drive the new stack. The Jones & Laughlin Steel Co. now has six Eliza furnaces, each rated at 500 tons per day; one Soho, 400 tons per day, and four Aliquippa furnaces, each 500 tons per day, these 11 stacks giving the company a total output of about 5400 tons of pig iron per day when all are in operation.

Fabricated Steel Business in May

The records of the Bridge Builders' & Structural Society, as collected by George E. Gifford, its secretary, shows that 56½ per cent of the capacity of the bridge and structural shops of the country was put under contract in May. This compares with 61 per cent in April, or about 101,500 tons in May as compared with 110,000 in April.

The Nova Scotia Steel & Coal Company, New Glasgow, N. S., has all the orders on hand it can handle for the year, according to the directors. More steel is going through the mills than ever. The Eastern Car Company, a subsidiary of the Nova Scotia Steel & Coal Company, has business on hand which will keep the works operating to capacity until March of next year.

The Trumbull Steel Co., Warren, Ohio, has declared a special dividend of 1 per cent on its common stock, at the request of many stockholders who wish to contribute the amount to the Red Cross War Relief Fund.

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PRICES FOR SHIP STEEL

President Wilson Likely to Settle the Goethals-Denman Controversy

WASHINGTON, June 19.—A new controversy has arisen between Chairman Denman of the United States Shipping Board and General Goethals, general manager of the Emergency Fleet Corporation, that promises to end with the resignation of one of these officials as the result of action soon to be taken by President Wilson to clothe one of them with supreme authority to control the expenditures authorized by Congress on account of the board. The question at issue is the price to be paid for the steel to be used in the construction of cargo-carrying vessels for the emergency fleet, General Goethals insisting that the steel makers should receive a fair price, while Mr. Denman declares he will sign no contract involving a price higher than that now being paid by the Navy Department under an agreement secured by Secretary Daniels which was practically forced from the steel makers under duress. The decision of the controversy is expected before the end of the present week.

"Tentative" Price $95.20, Then $56

The latest eruption in the Shipping Board followed the announcement by General Goethals on the 16th instant that he had agreed "provisionally" upon the price of $95.20 per gross ton (or 4.25c. per lb.) for plates and $84 per gross ton for shapes (or 3.75c. per lb.) for ten 8800-ton steel ships to be built in the yards of the Downey Construction Company of New York. The General added that this price was fixed tentatively, "with the understanding that the committee on raw materials of the Advisory Commission of the Council of National Defense would later go into the question of costs and determine an equitable return to the steel men," the figure decided upon to govern contracts to be made hereafter, at least while present conditions prevail. This announcement was promptly followed by a statement from Chairman Denman, who declared that he would sign no contracts at the prices named by General Goethals, which he said were $30 per ton more than the Navy is now paying for similar material.

In the interest of harmony General Goethals then took up the question of price with the sub-committee on steel of the Advisory Commission of the Council of National Defense and secured an agreement under the terms of which the price was reduced to $56 per gross ton (or 2.50c. per lb.) on condition that this figure should not be regarded as determining the final price to be paid, which would be decided hereafter by negotiations with the steel committee. This tentative price, it will be noted, is materially less for plates than that at which the Navy Department has secured the steel for the warships included in the latest naval program. On the basis of the figure referred to Chairman Denman approved the contract. It is an interesting fact in this connection that the Shipping Board has heretofore approved contracts for eight steel ships to be built by the Los Angeles Shipbuilding & Dry Dock Co. on the basis of steel plates at 4.25c. and shapes at 3.75c.

President to Decide

Upon the execution of the contract with the Downey Construction Company General Goethals called upon the general munitions board and laid the matter of the price of steel before Chairman Scott with a request that the Council of National Defense, which has no statutory jurisdiction over the Shipping Board, should take the matter up with its steel committee and fix a reasonable price for plates and shapes. When Chairman Denman was informed of this action he declared that any decision made by the Council of National Defense would be regarded by the Shipping Board as advisory only and that under no circumstances would he approve contracts at prices above the figures paid by the Navy. Subsequently, both Mr. Denman and General Goethals called at the White House to see the President. President Wilson has already announced that he hopes before the end of the present week to designate the agency in the Shipping Board that will be authorized, under the terms of the war budget act, to disburse the $405,000,000 appropriated thereby for the construction of the emergency fleet. It is obvious, in view of Mr. Denman's attitude, that the decision of the steel committee will not terminate this controversy, unless the figures named for plates and shapes are satisfactory to the chairman of the Shipping Board, and that in all probability the entire controversy will have to be settled by the President.

It is stated by the munitions board that a meeting of the steel committee will probably be held in New York before the end of the present week for the purpose of fixing a fair price for steel shapes and plates for the emergency fleet. Final determination of the Goethals-Denman controversy is likely, however, to be made at the White House rather than by the Council of National Defense. W. L. C.

Steel Companies to Be Merged

The Blaw Steel Construction Co., Pittsburgh, and the Knox Pressed & Welded Steel Co., Wheatland, Pa., will be merged July 1 as the Blaw-Knox Co., a change of name under the charter of the present Blaw Steel Construction Co. The authorized capitalization will be $2,000,000. The plant of the Blaw Steel Construction Co., manufactures steel forms for concrete work, steel transmission towers, clam shell buckets, and general structural steel fabrication. The plant of the present Knox Pressed & Welded Steel Co., manufactures water cooling devices for open-hearth furnaces, and also heavy hydraulic pressed steel plate work. The general sales offices of the company will be in Pittsburgh, with branch offices, as they now exist, in New York, Chicago, Boston and San Francisco, with general executive offices at Hoboken, Pa. The present officers of the Blaw Steel Construction Co. retain their present titles in The Blaw-Knox Co., and the board of the present Blaw Steel Construction Co. will be increased to take in five of the directors of the Knox Pressed & Welded Steel Co.

Benzol and Toluol Markets

NEW YORK, June 18.

Government requirements of toluol for the making of trinitrotoluol have practically absorbed the output of producers for many months. Prices on contract range from $1.50 to $1.75, according to quantity and delivery. The Government purchases have been made at the inside figure. The Aetna Explosives Co. is reported to have purchased a large order at $1.25 a gallon.

Benzol is pretty well sold up for a few months ahead, but there are larger quantities available for spot shipment than of toluol. The demand for benzol for making picric acid has been increasing. Prices remain firm on the basis of 55 to 60 cents for the pure.

Ammonium sulphate production has been contracted for 12 months ahead by manufacturers of fertilizers. The present price ranges from $4.40 to $4.50 per cwt., bulk basis, Atlantic ports.

The Helfenstein type of electric reduction furnaces for making pig iron direct from iron ore is no longer in operation at Domnarfvet, Sweden, according to a communication to the London *Iron and Coal Trades Review* from Sweden. Only the Electro-Metals type is now operating there, of which there are three, the latest having a capacity of 1000 b.h.p.

MANUFACTURERS VERY ACTIVE

Thousands of Employees and Employers Subscribe for Liberty Bonds

Liberty loan subscriptions received by the Government from iron, steel and machinery manufacturers and their employees have contributed in no small measure to the tremendous success of the bond issue. Nearly all of the manufacturers made it possible for their employees to subscribe to one or more bonds on easy terms of payment, the general plan being $5 per month for each $50 bond.

A seven-day Liberty loan campaign among the employees of the Bethlehem Steel Corporation resulted in subscriptions aggregating $5,424,450. Of approximately 68,000 employees solicited 86.8 per cent subscribed, the average subscription per employee being $91.18. More than 1000 salesmen selected from the various departments made up the committee which canvassed the plants.

"Liberty loan day" at the various plants of the General Electric Co. resulted in the sale of nearly $3,000,000 worth of the bonds. The Schenectady works, with 22,000 employees, the largest plant, and the company's main office, leads with a total of $1,055,700. The Lynn, Mass., plant is second with $577,450; Pittsfield works, $176,900; Edison Lamp Works, $211,900; Fort Wayne works, $151,550; Sprague works, $57,550; National Lamp Works, $253,600; district sales offices, $208,350. The company had previously announced the purchase of $5,000,000 worth of the bonds and that it would buy bonds to any amount the employees would subscribe and permit them to pay for them on the instalment plan. A large number took advantage of the opportunity to purchase bonds in this way. In a number of departments, every employee subscribed for a bond. The sales among workmen of foreign extraction, particularly Italian and Polish, were astonishingly large.

Liberty loan subscriptions by employees of the White Co., motor car manufacturer, Cleveland, passed the $200,000 mark at noon on June 12.

Portland, Ore., builders of steel ships, banded together and made a contribution of $1,500,000 to the loan. The subscribers are the Northwest Steel Co., the Willamette Steel & Iron Works, the Columbia River Shipbuilding Corporation, and the Smith & Watson Iron Works.

The Combustion Engineering Corporation, 11 Broadway, New York, has obtained $6,000 in subscriptions. About 50 per cent of its employees subscribed on a partial payment plan.

The Submarine Boat Corporation has subscribed for $1,000,000 and the total subscriptions of DuPont de Nemours & Co. and its employees were $7,500,000. The employees of the John A. Roeblings' Sons Co., Trenton, N. J., subscribed for $175,000 of the Liberty bonds and the total subscriptions of the Roebling interests were $1,100,000. The Victor Talking Machine Co., Camden, N. J., took $1,115,000.

Included in the New Jersey and Pennsylvania factories whose employees took an active interest in the Liberty bond subscriptions were the following: Harrisburg Pipe & Pipe Bending Works, Harrisburg, Pa., $100,000; Sheldon Axle & Spring Co., Wilkes-Barre, Pa., $30.500; S. Flory Mfg. Co., Bangor, Pa., $10,000; Camden Forge Co., Camden, N. J., $17,000; Niles-Bement-Pond Tool Works, Philadelphia, $25,000; Jeansville Iron Works, Hazleton, Pa., $20,000.

..t Jersey City, N. J., the following Liberty bond subscriptions have been made: The Joseph Dixon Crucible Co., $1,000,000; The American Type Founders Co., $100,000; the Standard Motor Construction Co., $300,000; The Brown Dry Dock Co., $50,000.

Milwaukee's subscription to the 1917 Liberty Loan on June 15 amounted to $17,550,000, compared with the city's quota of $14,000,000. During the last week of the subscription period, practically every large metal-working concern halted operations for several hours while heads of departments and officers talked to employees concerning the bonds. Among the employers who made addresses in other plants, at the invitation of their heads, were E. J. Kearney and Theodore Trecker, Kearney & Trecker Co.; Frederick L. Sivyer, Northwestern Malleable Iron Co.; Gen. Otto H. Falk, Allis-Chalmers Mfg. Co., and Walter Davidson, Harley-Davidson Motor Co.

The Taylor-Wharton Iron & Steel Co., High Bridge, N. J., and its subsidiaries, Wm. Wharton, Jr. & Co., Inc., Easton, Pa., Philadelphia Roll & Machine Co. and Tioga Steel & Iron Co., Philadelphia, worked out a successful plan for inducing employees to subscribe. Any salaried employee was allowed to pay the company in instalments at the rate of $5 per month for every $50 bond taken. Those working on day wage may pay at the rate of $1 per week for each $50 bond. It has been arranged that every subscriber for a single $50 bond will be protected in case of death or a call to military service. The company assumes responsibility for balance unpaid at time of death or call, and will turn over the bond, at the expiration of the instalment period, to the subscriber or his estate. Consideration will also be given to employees who through sickness are unable to meet payments, and an extension of time will be arranged for. The response has been large and the subscriptions have been liberal.

One hundred per cent of the employees of the American Steel Export Co., Woolworth Building, New York, some 80 in all, subscribed to the Liberty Loan.

The Jones & Laughlin Steel Co., Pittsburgh, has bought a total of $3,000,000 of Liberty bonds. The company purchased $1,000,000, then $1,500,000 more, and last week again subscribed for $500,000, thus making its total subscriptions $3,000,000.

The employees of the Youngstown Sheet & Tube Co., Youngstown, Ohio, are estimated to have purchased about $600,000 of Liberty bonds. An active campaign was conducted by heads of different departments to get the men to buy bonds, and it is estimated about 6800 employees, or 60 per cent of the entire force, subscribed. Employees of the Brier Hill Steel Co., also at Youngstown, are said to have bought about $150,000 worth of bonds. Employees of both concerns will be allowed to pay for the bonds on monthly payments of about 10 per cent each. The Youngstown Sheet & Tube Co. subscribed for $3,000,000 of bonds, and the Brier Hill Steel Co. for $1,000,000.

To Train Shipyard Labor

The Boston Chamber of Commerce has a special committee at work to stimulate interest in the shipbuilding industry in New England and to secure and train labor for the shipyards. At a recent meeting of this committee, H. Gerrish Smith, vice-president and general manager of the Fore River Shipbuilding Corporation, suggested that men could be trained intensively for a month in Massachusetts technical schools and stated that he believed this would help materially in solving the problem of obtaining partially trained labor. The chairman of a special committee which has been investigating the problem of training labor for the shipyards announced that all the technical schools of the city of Boston would be placed at the disposal of the committee for the summer and suggested that the Government be asked for an appropriation of $50,000 to aid in the work.

The Fore River Shipbuilding Corporation now has contracts for 67 ships, including battleships, destroyers, submarines and merchant ships. Of these, 12 are merchant ships being built for private concerns and are not a part of the Government's emergency ship program.

Remodeling and improvement work on the old Vesta furnace, Marietta, Pa., is being pushed to rapid completion with day and night working forces by the new owners, E. J. Lavino & Co., Bullitt Building, Philadelphia. It is expected to place the plant in operation about July 15.

The payroll of the Youngstown industries for May totaled $5,402,315. This is a record for the city.

Iron and Steel Markets

PRICES BOUNDING UPWARD

Large Government Wants Affect Buyers

Wire Nails Advanced to $4 per Keg—Government Buys Shell Steel at 3.75 Cents

While the question of Government prices for steel products is being made a political football in Congress, with no outcome yet from the jumble of price-fixing by conflicting departments, boards and committees, the markets both for iron and steel go on advancing with no signs of control. Many producers have stopped selling in the face of high offers from eager consumers. Others, as in the case of the leading wire interest, have refused to advance their prices. But such action does not have the intended effect.

Activity in the wire trade has been for some time largely in the products of independent makers. Two of these have just announced a $4 price for wire nails, which is 50c. per keg or $10 per ton advance over the nominal market of recent weeks. Other independents, who lately withdrew prices, are expected to follow.

In other lines there have been similar upward lurchings, refined bar iron and rivets advancing $10 per ton at Pittsburgh. Ohio silvery irons are $10 per ton higher, foundry irons $2 to $3, coke 50c. to $1, cast iron pipe $2, and some grades of scrap, $2 to $5.

The efforts at Washington to depress prices on steel for the Government and its Allies have had no quieting effect on the general market. On the contrary, now that it is known that the consolidated buying for war needs will be on a large scale, there is more excitement among private buyers and price movements reflect it.

The world-wide famine in plates which has sent their price up twice as far as that of other steel products usually sold on the same level, and the fact that the Government wants more plates than anything else have complicated the price-fixing problem. While there is clamor at Washington for a price below cost to plate mills which must pay $50 for basic iron, Japan has gladly paid 9c. and 10c. per pound for plates and is crowding shipbuilding to the utmost. Japanese buying has caused some sharp bidding up on plates in the past two weeks.

Until the appropriation is determined, the proposed Government purchase of 100,000 railroad cars waits. Not unless it becomes clear that Washington will not be a buyer are the railroads expected to take the initiative; but the one certain thing is that cars will be bought and on a large scale.

Fabricating plants had the lowest bookings of the year in May, the month's business representing only 56.5 per cent of capacity. Such companies are thus able to take an active part in the Government's plan of steel fabrication for ships and are preparing for it.

A total of 81,000 tons of steel was awarded by the Government to the various steel companies in connection with its recent contracts for 9,000,000 3-in. shrapnel and high explosive shells. The price was 3.75c., or considerably below what the Allies paid for similar steel now going to Europe.

The sheet mills are getting large inquiries as the result of Government activities represented in contracts for helmets, ambulance bodies, camp stoves, munition buildings and equipment for submarine chasers.

Steel mills are behind in shipments of both billets and sheet bars and output of sheet and tin plate mills has suffered in consequence. Large shipments of shell steel are still being made to the Allies from Central Western mills. Forging billets have sold at $135 and discard steel rerolled into billets at $95.

The Bessemer pig-iron market has quieted down. A sale of basic in the Central West was at close to $51 at furnace, or $1 more than in the previous week. Foundry No. 2 has sold at $53 at Central Western furnace, but earlier buying of 10,000 tons for electric works at Cleveland was at $50, Valley furnace. Southern foundry iron has bounded up to $45 for No. 2 at Birmingham for this year and iron for such delivery is in scant supply.

All pig-iron markets show more irregularity in prices as higher figures are reached. Alabama iron for this year shows a range of $3, and in southern Ohio iron from $50 to $55 has been the swing of the week's quotations. On 8 per cent silicon iron transactions have been all the way from $60 to $70, and for 10 per cent silicon $90 has been paid.

A labor shortage has developed at Lake Superior iron mines, particularly on the old ranges, and indications are that the production of some shippers will be from 10 to 15 per cent short of sales.

Government buying of lead on an 8c. basis is indicated, but the year's requirements are not likely to be up to some earlier estimates. Predictions of a 25c. basis on Government copper contracts have appeared to have substantial sanction, but the outcome in steel will undoubtedly be an influence.

Pittsburgh

PITTSBURGH, June 19.

Following the great activity of the past few weeks in raw materials such as pig iron, steel scrap, coke, and also in semi-finished steel, the market on these materials has quieted down, but prices remain very firm. There are still persistent reports that the Government will commandeer practically all the plants making pig iron, semi-finished steel and finished materials, but it is not believed these reports are correct. There is no real necessity for the Government to take such action, as all the makers of iron and steel have pledged their word that their plants are ready to serve Government needs in every way possible and that Government orders will have preference in shipments over all other business on the books of the blast furnaces and the steel mills. Nothing more than this could be gained by the Government commandeering any plants, and it is not believed it will be done. It is thought that before long Government purchases, both direct and indirect, will take very

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 20, 1917.	June 13, 1917.	May 23, 1917.	June 21, 1916.
No. 2 X, Philadelphia...	**$49.75**	$46.75	$44.00	$19.75
No. 2, Valley furnace...	**53.00**	50.00	43.00	18.25
No. 2 Southern, Cin'ti...	**46.90**	42.90	42.90	17.40
No. 2, Birmingham, Ala..	**44.00**	40.00	40.00	14.50
No. 2, furnace, Chicago*.	**52.00**	50.00	45.00	19.00
Basic, del'd eastern Pa.	**48.00**	42.50	42.00	19.50
Basic, Valley furnace....	50.00	50.00	42.00	18.00
Bessemer, Pittsburgh ...	55.95	55.95	45.95	21.95
Malleable Bess., Ch'go*.	**52.00**	50.00	45.00	19.50
Gray forge, Pittsburgh..	47.95	47.95	40.95	18.70
L. S. charcoal, Chicago..	52.00	52.00	50.25	19.75

Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	38.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	40.00
Bess. billets, Pittsburgh.	100.00	100.00	90.00	42.00
O.-h. billets, Pittsburgh.	100.00	100.00	90.00	42.00
O.-h. sheet bars, P'gh....	105.00	105.00	90.00	42.00
Forging billets, base, P'gh	125.00	125.00	110.00	69.00
O.-h. billets, Phila.....	**110.00**	95.00	90.00	50.00
Wire rods, Pittsburgh...	95.00	95.00	85.00	55.00

Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.659	4.659	4.159	2.659
Iron bars, Pittsburgh....	**4.75**	4.25	4.00	2.50
Iron bars, Chicago	4.00	4.00	3.50	2.35
Steel bars, Pittsburgh...	**4.50**	4.25	4.00	2.75
Steel bars, New York...	**4.669**	4.419	4.169	2.919
Tank plates, Pittsburgh..	8.00	8.00	6.50	3.75
Tank plates, New York..	8.669	8.669	6.919	3.919
Beams, etc., Pittsburgh..	**4.50**	4.25	4.00	2.50
Beams, etc., New York..	**4.669**	4.419	4.419	2.669
Skelp, grooved steel, P'gh	4.00	4.00	3.50	2.35
Skelp, sheared steel, P'gh	6.00	6.00	5.50	2.45
Steel hoops, Pittsburgh..	5.25	5.25	4.25	2.75

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	June 20, 1917. Cents.	June 13, 1917. Cents.	May 23, 1917. Cents.	June 21, 1916. Cents.
Sheets, black, No. 28, P'gh	8.00	8.00	7.50	2.90
Sheets, galv., No. 28, P'gh	**9.75**	9.50	8.50	4.60
Wire nails, Pittsburgh...	**4.00**	3.50	3.50	2.50
Cut nails, Pittsburgh....	**4.65**	4.00	3.75	2.60
Fence wire, base, P'gh...	**3.95**	3.45	3.45	2.45
Barb wire, galv., P'gh...	**4.85**	4.35	4.35	3.35

Old Material, Per Gross Ton:				
Iron rails, Chicago.....	**$47.00**	$43.50	$34.50	$18.00
Iron rails, Philadelphia.	**50.00**	45.00	35.00	20.00
Carwheels, Chicago	**43.00**	36.00	30.00	12.25
Carwheels, Philadelphia..	35.00	35.00	29.00	16.50
Heavy steel scrap, P'gh.	42.00	42.00	29.00	15.75
Heavy steel scrap, Phila.	**37.00**	32.50	26.00	15.00
Heavy steel scrap, Ch'go	**39.00**	35.00	29.00	14.50
No. 1 cast, Pittsburgh...	**37.00**	35.00	26.00	15.75
No. 1 cast, Philadelphia.	32.00	32.00	30.00	16.00
No. 1 cast, Ch'go (net ton)	**32.00**	30.00	25.00	11.50
No. 1 RR. wrot, Phila..	**55.00**	50.00	42.00	20.00
No. 1 RR. wrot. Ch'go (net)	**44.00**	40.00	34.00	15.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	**$11.50**	$11.00	$8.50	$2.40
Furnace coke, future	9.50	9.50	8.00	2.50
Foundry coke, prompt...	12.00	12.00	9.00	3.25
Foundry coke, future....	10.00	10.00	9.00	3.50

Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	32.50	32.50	31.50	27.75
Electrolytic copper, N. Y.	32.50	32.50	31.50	27.00
Spelter, St. Louis.....	9.50	9.50	9.25	12.25
Spelter, New York.....	9.75	9.75	9.50	12.50
Lead, St. Louis	*11.50*	11.87½	10.72½	6.45
Lead, New York.....	*11.75*	12.00	10.87½	6.62½
Tin, New York.....	**63.50**	60.62½	65.50	40.75
Antimony (Asiatic), N. Y.	*19.00*	20.00	25.50	18.00
Tin plate, 100-lb. box, P'gh.	**$11.00**	$10.50	$8.50	$5.75

close to 40 per cent of the output of finished steel in this country, which at the present time is running at 32,000,000 to 33,000,000 tons per year. This, of course, would include all purchases of steel in any forms for the Allies. If this program is carried out, it means that domestic consumers will have to wait still longer for deliveries from the mills, and in turn, their customers will have to wait much longer before they get their finished goods. Price changes during the week were few. Bessemer iron remains at $55, Valley furnace, with chances that on the next buying movement the price will go to at least $58, and possibly $60. Basic is very strong at $50, with reports that $51 has been done on a 5000-ton lot. No. 2 foundry iron has advanced squarely to $53, while malleable Bessemer and gray forge are unchanged. Ordinary ¼-in. sheared plates have sold at 8c. at mill, which now seems to be the minimum price. Refined iron bars have been advanced $10 per ton, and rivets the same. Prompt furnace coke is higher, best grades selling at $11.50 and $12 per net ton at oven. Some grades of scrap are up $2 to $3 per ton. The car supply is a little better, and last week in the coke regions was the best for several months.

Pig Iron.—The local market has quieted down after the vigorous buying of the past two or three weeks. It is estimated that fully 125,000 to 150,000 tons of pig iron was sold on the recent buying movement. The Westinghouse Electric & Mfg. Co. is reported to have closed for about 10,000 tons of No. 2 foundry for its Cleveland works. The price is said to have been around $50 at Valley furnace. The Mesta Machine Co. had an inquiry out for 10,000 tons of Bessemer iron for delivery in first half of 1918, but on account of the abnormal high prices ruling on Bessemer, decided not to buy for the present. A local open-hearth steel plant is said to have bought 5000 tons of basic iron for delivery in last quarter of this year at $52, delivered, equal to $51.05 at Valley furnace. We also note sales of about 4500 tons of standard No. 2 foundry iron for delivery this year at $53, Valley furnace, and sales of 3000 to 4000 tons for first half of 1918 at the same figure. Very little pig iron is being offered even at present prices, furnaces and dealers all being of the belief that the prices will go still higher. We now quote standard Bessemer iron, $55; malleable Bessemer, $52 to $53; No. 2 foundry, $53; basic, $50 to $51, and gray forge, $47, all at Valley furnace. The freight rate for delivery in the Cleveland or Pittsburgh districts is 95c. per gross ton from Valley furnaces.

Structural Material.—The new inquiry is quiet, and fabricators are not anxious to take on much new business until they know more definitely what Government demands will be made on them for their product. The McClintic-Marshall Co. has taken 9300 tons for crane runways and buildings for the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., and about 700 tons for a State hospital for the insane at Byberry, Pa., and the American Bridge Co. has taken 900 tons for new steel mill buildings for the Baltimore Tube Co. at Baltimore. We now quote beams and channels up to 15-in. for mill shipment at 4.50c. to 4.75c., while from warehouse, prices range from 5.25c. up to 6c., depending on quantity.

Plates.—The opinion is getting more general that the Government needs of plates will be very close to 40 per cent of plate mill capacity. Of course this will include purchases of plates for the Allies, in addition to what will be needed for the boats and other work to be built by our own Government. The tentative price of $56 per ton fixed yesterday at Washington on steel plates for the fleet of merchant ships to be built by the Shipping Board Emergency Fleet Corporation is regarded here as being entirely too low, and it is not believed it will stand. Some small car orders have been placed in the past week. The Marianna Coal Co. has placed 1000 steel coal cars with the Cambria Steel Co.

and the Aliquippa & Southern Railroad, owned by the Jones & Laughlin Steel Co., has placed 50 steel gondolas with the Pressed Steel Car Co. The Standard Steel Car Co. will build five armored cars for the United States Government. The minimum mill price on ¼-in. and heavier steel tank plates now seems to be 8c. at mill, and sales have been made at as high as 9c. We therefore quote ¼ in. and heavier sheared plates at 8c. to 9c. at mill for delivery in four to six months, while plates from warehouse for prompt delivery bring 10c. to 11c., depending on quantity. Ship plates are now quoted at 10c. to 11c. at mill. The above prices apply only on domestic orders.

Steel Rails.—The new demand for light rails is abnormally active, coming from the lumber and coal mining interests and also from general contractors. Heretofore many users of light rails, when they could not get prompt deliveries from the mills, would buy old rails from the railroads and they would serve the purpose of the buyer very well. Now these old rails are worth nearly as much when sold as scrap as new light rails cost, and this has resulted in a very heavy increase in the new demand for light rails. The Carnegie Steel Company is sold up on light rails through the first half of 1918, and in fact has very few to spare for second half of next year delivery. No orders are being placed for standard sections.

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 4c. to 4.25c. at mill. We quote light rails as follows: 25 to 45 lb., $60; 16 to 20 lb., $61; 12 and 14 lb., $62; 8 and 10 lb., $63; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard section rails of Bessemer stock are held at $38, and open-hearth $40, per gross ton, Pittsburgh.

Tin Plate.—Conditions in the tin plate trade are unchanged. Nearly all the mills are running on bright plate as far as they can, and it now seems fairly well assured that the supply of bright plate for containers for perishable foods will be large enough to meet the demand. Many former consumers of bright plate have had their supply cut off and must turn to other materials in which to market their products. The tin plate mills are co-operating eagerly and freely with the Government and are doing all they can to meet the situation. Sales of bright plate for delivery over the second half of this year have been made at $15 per base box, at mill. On small lots from stock, primes bring $11 to $12, and about 25c. less for wasters. The demand for terne plate is quiet, as many mills have practically stopped making it, putting their entire output into bright plate.

We quote long terne plate, No. 28 gage base, at $7.25 to $7.50; short terne plate, $12 to $12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terne plate is as follows: 8-lb., 200 sheets, $14 per package; 8-lb., 214 sheets, $14.30 per package; 12-lb., I. C., $15.25 per package; 15-lb., I. C., $15.75 per package; 20-lb., I. C., $16.50; 25-lb., I. C., $17.25; 30-lb., I. C., $18; 35-lb., I. C., $18.75; 40-lb., I. C., $19.50.

Hoops and Bands.—As noted in this report last week, there are really no market prices on either hoops or bands. Mills are practically sold out for the remainder of this year, and consumers who must have either hoops or bands must pay heavier premiums in prices to get them. These prices range from 5c. to 5.50c. on steel hoops, and 4.75c. to 5c. on steel bands, f.o.b. at mill, and for such deliveries as mills can make.

Iron and Steel Bars.—Effective Friday, June 15, prices on refined iron bars were advanced $10 per ton, or from 4.25c. to 4.75c. at mill. The higher cost of pig iron and muck bar, and the active demand for iron bars are given as the reasons for this heavy advance. Specifications on contracts for steel and iron bars are coming in freely.

We now quote steel bars at 4.50c. to 5c. for delivery late this year, and 5c. and higher from warehouse, in small lots, for prompt shipment. We quote refined iron bars at 4.75c., and railroad test bars at 5.25c. in carloads and larger lots f.o.b. mill.

Sheets.—The sub-committee on sheet steel has been holding almost daily sessions in the rooms of the National Association of Sheet and Tin Plate Manufacturers in this city, and has been giving most of its attention to keeping in touch with mills furnishing sheets for direct and indirect Government needs to get out deliveries as promptly as possible, and is succeeding in its work. No official estimate has been given as to the quantity of sheets already placed by the Government direct or through other channels, but it is estimated to already have reached 40,000 tons or more. Nearly all sheet mills in this district and further West are turning out more or less sheets for the Government or for materials to be used for war purposes. One recent contract for 6000 tons of black sheets was placed with several mills to be used in making camp stoves. Prices being charged for sheets by the mills for Government use are probably from $20 to $25 per ton less than the regular market. Nearly all the larger makers of sheets are practically out of the market, as with orders already on their books and demands being made on them by the Government, they have no more sheets to spare for this year delivery. The supply is getting very short, and prices are steadily going higher.

We quote No. 3 to 8 gage, blue annealed sheets, 8c. to 8.50c.; No. 28 box annealed one pass Bessemer, cold rolled, 8c. to 8.50c.; No. 28 galvanized, 9.75c. to 10.25c., and No. 28 black plate, tin mill sizes, 7.50c. to 8c., all f.o.b. mill, Pittsburgh. These prices are for carload and larger lots for delivery over the next 4 to 6 months to the domestic trade. For fairly prompt delivery, premiums are still being paid.

Muck Bar.—Muck bar made from all pig iron is now held at about $90 per ton, maker's mill. The local maker is practically sold up for the remainder of this year.

Wire Products.—Effective Tuesday, June 15, prices on all wire products were advanced $10 per ton, making wire nails $4 and bright basic wire $3.05 per 100 lb. These advanced prices are in effect only by the independent makers, the American Steel & Wire Co. not having announced any change in its prices. Two independent wire mills have not absolutely announced the new prices, but have withdrawn all old prices, so that the advance is practically general by all independent mills. Discounts on woven wire fencing have been lowered five points and are now 43 per cent off in carload lots, 42 per cent in 1000-rod lots and 41 per cent for small lots, f.o.b. Pittsburgh. We quote:

Wire nails, $4.00 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $3.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Wire Rods.—The domestic demand for wire rods is still very heavy, and there is also an active demand from Canada. It is said that recently soft Bessemer open-hearth rods for shipment to Canada have sold at $100 per ton at maker's mill. High carbon rods are said to have recently sold as high as $120 maker's mill.

We quote soft Bessemer and open-hearth rods to domestic consumers at $95 to $100; high-carbon rods made from ordinary open-hearth steel, $100 to $110, and special steel rods, with carbons running from 0.75 to 0.90, $110 to $120 at mill.

Billets and Sheet Bars.—Very little is being done in either billets or sheet bars, as the steel simply cannot be had. It is said that offers of $105 for soft Bessemer or open hearth sheet bars for last half delivery have been turned down. All the steel mills are back in shipments in both billets and sheet bars, and this is cutting down output of sheets and tin plate very materially. Very large quantities of shell steel are still being shipped to the Allies by several Youngstown, Ohio, mills, these shipments running about 45,000 tons per month.

We now quote soft Bessemer and open hearth billets at $95 to $100, and soft Bessemer and open hearth sheet bars at $105 to $110, maker's mill, Pittsburgh or Youngstown. We quote forging billets at $125 to $135 per ton for ordinary sizes and carbons, f.o.b. maker's mill.

Ferromanganese.—The new demand for ferromanganese for prompt shipment, and also for delivery over the remainder of this year and in first half of 1918, is quite heavy. Most contracts now being made are for

delivery first half of next year, this indicating that consumers are pretty well covered for this year. We note a contract for 400 tons of 80 per cent domestic ferromanganese, for shipment in first half of 1918, at about $355 delivered. We quote 80 per cent domestic ferromanganese for prompt shipment at $425 to $450 per gross ton at furnace. On contracts for last half of this year $400 to $425 and for first half of next year, $350 to $375, but it is not likely any material could be obtained at much less than $375 at furnace for first half of next year. It is said that small sales of 50 per cent ferrosilicon are still being made for prompt shipment at prices ranging from $200 to $250 per ton. We quote 18 to 20 per cent Spiegeleisen at about $80 and 25 to 30 per cent at $100 to $110, delivered. Prices on Bessemer ferrosilicon and silvery iron are very firm.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $51 to $52, 8 per cent $52 to $53, 9 per cent $54 to $55, 10 per cent $55 to $56, 11 and 12 per cent $57 to $58. All f.o.b. at maker's furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Shafting.—The Government is reported to have placed some large contracts for shafting to be used in trucks and other vehicles for war purposes. The new demand and specifications for shafting from the automobile and implement trades have fallen off very much, but from the screw stock machine trade new orders and specifications are heavy. Deliveries on large rounds and squares are not promised inside of four or five months and on smaller sizes from 10 to 12 weeks. Discounts on cold-rolled shafting range from list to 10 and 5 per cent off, but 15 per cent off list is still being done to some of the larger consumers on desirable specifications.

Railroad Spikes and Track Bolts.—Makers continue to report the new demand for railroad spikes as very quiet, the railroads evidently not having prepared their plans for new track laying and extensions to be made during last half of this year. The railroads, like the steel mills, do not know what demands for transportation will be made on them by the Government when war supplies and troops start to move freely, and they are holding back placing orders for track equipment. The demand for boat spikes from the ship yards is abnormally heavy. Some makers are sold up for all of this year and have large contracts to be filled during 1918. The demand for track bolts is fairly heavy.

We quote railroad spikes 9/16 in. and larger at $4.00 to $4.10 base, ⅝ in., 7/16 in. and ½ in., $4.50 to $5.00 base, 5/16 in., $5 to $5.50 base. Boat spikes are about $5 base, all per 100 lb. f.o.b. Pittsburgh, but some makers are quoting above that price. We quote track bolts with square nuts at 6c. to 6.50c. to railroads, and 7c. to 7.50c. in small lots, for fairly prompt shipment.

Cold Rolled Strip Steel.—Makers are now confining sales of cold-rolled strip steel for delivery within 60 days, and are insisting that on all new contracts placed during the remainder of this month, 50 per cent of specifications must be in their hands by July 1 or a few days after and the other 50 per cent by August. On such contracts, mills are charging about 9c. at mill, while on small current orders prices range from 10c. to 12c. at mill. Terms are 30 days net, less 2 per cent cash in 10 days, delivered in quantities of 300 lb. or more.

Wrought Pipe.—The output of the iron and steel pipe mills has not been officially commandeered by the Government as reported, but the mills have assured the Government that they are ready to serve it to the best of their ability, and part or all of their output is at the Government's services when needed. This has resulted in the pipe mills drawing still closer lines of sales, and the mills are fighting shy of taking any new business, except from their regular customers. For many months the National Tube Co. has not been an active seller of tubular goods, conserving its entire output for regular trade as best it can, and this is also true of perhaps all other pipe mills. All kinds of inquiries for line pipe for gas and oil projects are in the market, but when offered to the mills, they are usually promptly turned down, the mills simply stating they are unable to quote. One order was placed recently by the Oklahoma Natural Gas Co. for 70 miles of 12-in. pipe with a Youngstown, Ohio, mill. The Gulf Refining Co. of this city is in the market for about 100 miles of 6-in. line pipe, and is also inquiring for about 20,000 tons of oil country goods for its requirements of 1918. The falling off in building operations all over the country has cut down very materially demand for butt weld pipe, and this is welcomed by the mills as it allows them to put the steel into lap weld pipe, which they so badly need.

Very high prices are ruling for crude oil, which have created an abnormal demand for oil country goods, and all the mills are back in deliveries four to six months. Heavy premiums over regular prices are being paid right along for tubing and casing, which have sold at unheard of prices. On lap weld iron and steel pipe, mills are sold up for this year, and have large orders for early 1918 delivery, but on the small demand for butt weld pipe, can make shipments in 10 to 12 weeks. On oil country goods none of the mills is promising deliveries on new contracts inside of six months. The National Tube Company has made no changes in its discounts on tubular goods since April 2, but the independent mills are quoting to regular customers only the discounts adopted on May 1 on butt and lap weld iron and steel pipe, and these are given on another page.

Boiler Tubes.—Under present conditions in the iron and steel boiler tube market, actual prices ruling cannot be accurately quoted. For many months, makers of iron and steel tubes have had their product sold up for a long time ahead, and either have been refusing orders or else have been quoting very much higher prices than ruled when the discounts, dated Nov. 1, 1916, on standard charcoal iron tubes, and April 2, 1917, on lap welded steel tubes were announced. Any sales that are made are to regular customers only, and practically every sale has its own price, this depending entirely on whether the buyer is a regular customer of the mill, the quantity of tubes wanted, and the delivery. It is said that tubes have sold at $20 per ton and more higher than the prices as quoted on the above discounts, which have been obsolete for a long time.

Nuts and Bolts.—Makers still report the new demand abnormally heavy, but say it is almost impossible to get steel in even fairly large quantities, with the result that their output is cut down 50 per cent or more in some cases. Foreign inquiry is heavy, but not much attention is paid to this, as makers are keeping their entire output for domestic trade, the demands of which they cannot meet promptly, being back in deliveries 8 to 10 weeks, or longer. Prices are very strong, but are not likely to be advanced in the near future, as the makers believe the market is plenty high enough, and should not be further advanced.

Discounts in effect are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq., blank, $2.10 off list, and tapped, $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c. p. c. and t. sq., blank, $1.70 off, and tapped, $1.50 off; hex. blank, $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Rivets.—Effective, Thursday, June 14, makers of rivets advanced prices $10 per ton. The demand is reported abnormally heavy, but most consumers are covered over the remainder of this year, and at lower prices

than are ruling now. Makers complain that deliveries of steel by the mills are getting worse, and this is cutting down their output to very great extent. The new prices on structural rivets are $5.25 per 100 lb., base, and on cone head boiler rivets $5.35, base, per 100 lb., f.o.b. Pittsburgh. Terms are 30 days net, or one-half of 1 per cent. off for cash in 10 days.

Coke.—Last week the average supply of cars in the Connellsville coke regions was about 65 per cent, the best for a long time, while on Monday, this week, the supply was 80 per cent, and the outlook for the remainder of the week is good. There is a very active demand for high grade furnace coke for prompt shipment, and it is bringing from $11.50 to $12 per net ton at oven. It is said that prompt furnace coke for shipment East over the Pennsylvania Railroad has sold at close to $13 per ton at oven. Important contract negotiations for furnace coke for second half of this year delivery are under way, and several of these contracts may be closed before this week is out. One Youngstown, Ohio, blast furnace has paid $9.50 for its supply of furnace coke for last half of the year, and it is believed that any more contracts made for best quality of furnace coke will not be below that price. Several more contracts for high grade 72-hour foundry coke have been closed for last half of this year delivery at $10 per net ton at oven. Prompt foundry coke of best grades is selling at $12 per ton or higher at oven. We now quote best grades of blast furnace coke for prompt shipment at $11.50 to $12, and on contracts $9.50 per net ton at oven. We quote best grades of 72-hour foundry coke for prompt shipment at $12 to $13 and on contracts $10 to $11 at oven. The Connellsville *Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending June 9 as 361,088 tons, an increase over the previous week of 15,368 tons.

Old Material.—Local conditions in the scrap trade are still very active, and prices on some grades have moved up $2 to $3 per ton in the past week. The embargo on scrap routed to the Pittsburgh Steel Co., Monessen, Pa., has been lifted, and it is said that concern is again a buyer of scrap. The demand for heavy steel scrap, No. 1 foundry cast, and low phosphorus melting stock is very active, and prices seem likely to go higher. Sales of 10,000 tons or more of heavy steel scrap are reported at about $42 delivered to buyers' mills, while No. 1 foundry cast has sold up to $37, delivered. Sales of low phosphorus melting stock of 2500 to 3000 tons are reported at $55 and higher, delivered. The demand for turnings and borings, from the steel companies for blast furnace use is still very heavy. The supply of scrap of all kinds available for the open market is short of meeting the demand, and some dealers are holding their scrap, waiting for still higher prices. New buying is reported very heavy in the Sharon and Youngstown districts, and also at points further West. Still higher prices on all grades seem likely, especially if pig iron continues to advance.

Prices for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, are now as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$42.00 to $45.00
No. 1 foundry cast	37.00 to 38.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	45.00 to 48.00
Hydraulic compressed sheet scrap	32.00 to 33.00
Bundled sheet scrap, sides and ends, f.o.b. consumers mill, Pittsburgh district	27.00 to 28.00
Bundled sheet stamping scrap	23.00 to 24.00
No. 1 railroad malleable stock	32.00 to 33.00
Railroad grate bars	20.00 to 22.00
Low phosphorus melting stock	55.00 to 57.00
Iron car axles	55.00 to 60.00
Steel car axles	55.00 to 60.00
Locomotive axles, steel	63.00 to 65.00
No. 1 busheling scrap	32.00 to 33.00
Machine-shop turnings	21.00 to 22.00
Old carwheels	38.00 to 40.00
Cast-iron borings	23.00 to 24.00
*Sheet bar crop ends	53.00 to 55.00
No. 1 railroad wrought scrap	46.00 to 48.00
Heavy steel axle turnings	27.00 to 28.00
Heavy breakable cast scrap	28.00 to 30.00

*Shipping point.

Chicago

CHICAGO, June 18.

Though Government requirements of various products are taking more and more definite shape, the steel mills do not yet know just what proportion of their output they will have to reserve, and there is a feeling in some quarters that the Government itself does not yet know, a situation not to be considered surprising. The plate mills have been requested not to export any plates conforming to Lloyd's specifications. The purpose is to conserve such material for home needs. The Government, in line with its shipbuilding program, is about to place orders for 40,000 tons of rivets and 25,000 tons of bolts. The structural shops, which have little to do, are hoping to have a hand in the building of ships. A Pittsburgh screw and bolt company has advanced its quotations for structural rivets to $5.25 per 100 lb., Pittsburgh base. Jobbers have advanced their quotations ¼c. The Government has taken several thousand tons of cast-iron pipe for water supply at army cantonments, and will need more. The makers of pipe have advanced their quotations $2 per ton. Northern pig iron has been advanced $2, making the price $52, furnace. Southern iron is almost unobtainable for last half delivery, and $1 higher, at $42, Birmingham, for the first half. The old material market continues to pursue a wild course. Dealers' material is scarce, and some of them are tempted by conditions to withdraw from the market.

Pig Iron.—The quotation for Northern malleable Bessemer, basic and No. 2 foundry has been advanced $2 a ton, and these grades are now at $52, furnace, for any delivery this side of July 1, 1918. The makers have sold about 85 per cent of their output for that period. Business is still fairly good considering the circumstances, although most of the consumers are covered for this year so far as present indications can determine. Southern iron is scarce, with no quotations for last-half delivery obtainable. The quotation for the first half—$40, Birmingham—at which business was taken last week has been withdrawn, and the lowest price now available for that position is $42, equal to $46, Chicago. At the latter price, some rather attractive sales have been made each day. No large inquiries are out at the present time. Representatives of a large producer of Southern iron estimate that it is about 65 per cent sold over the next 12 months. Malleable Bessemer is under more active inquiry than the other grades. Sellers of the silveries assert that they cannot obtain quotations from the producers. Low phosphorus iron made in this territory has been sold for nearby delivery at $85, delivered nearby. The maker has made sales for shipment to Japan, Italy and Holland, and as a result of a conservative policy in selling, has a fair amount on hand. For charcoal iron there appears to be no established price for the last half because of the very little iron that is available, and sales are being made at from $50 to $55, f.o.b. furnace, according to grade and delivery. The makers are in receipt of many inquiries, and one leading maker is declining to give quotations except to regular customers. Higher prices are indicated. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer, and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton. Northern basic, malleable Bessemer and No. 2 foundry in the table should have been quoted $50 last week.

Lake Superior charcoal, Nos. 1 to 4	$52.00 to $57.00
Lake Superior charcoal, Nos. 5 and 6 and Scotch	52.00 to 57.00
Northern coke foundry, No. 1	52.50
Northern coke foundry, No. 2	52.00
Northern coke foundry, No. 3	51.50
Northern high-phosphorus foundry	52.00
Southern coke No. 1 f'dry and 1 soft	48.50 to 49.50
Southern coke No. 2 f'dry and 2 soft	48.00 to 49.00
Malleable Bessemer	52.00
Basic	52.00
Low-phosphorus	85.00
Silvery, 8 per cent	62.54

Plates.—One maker has a few No. 8 plates of large size which he can offer at 8.15c., Middle Western mill, but general quotations for tank plates, delivery in four to five months, are unchanged at 8.50c. to 8.75c., Chi-

cago. For spot tank plates 10c. has been asked. The mills continue to turn down business in tank and ship plates, especially the latter. The Government has requested the mills not to export any plates conforming to Lloyd's specifications, and one mill, in consequence, will ship its entire production of hull plates to a Pacific Coast shipyard. A New York exporter is inquiring for 10,000 tons, with little prospect, however, of obtaining the plates in this district. Jobbers' quotations are unchanged.

We quote for Chicago delivery of plates out of jobbers' stocks, 8c.

Old Material.—What old iron and steel are worth is a question, inasmuch as prices continue to advance by leaps and bounds. Material is scarce with both dealers and consumers. The dealers are becoming worried to the point of developing a tendency to stay out of the market. Not only does their business require much more than the usual amount of money, but they complain that some of those from whom they have purchased are not making good on the deals, finding all sorts of excuses for not making deliveries. Meanwhile the dealers have commitments with the mills and sometimes find themselves short of material wherewith to fill them. On the other hand, should the dealers buy heavily at present prices, they would face enormous losses, should the market break. But few lists were offered by the railroads this week. Comparatively small quantities were offered by the C. & A. and the Great Northern, the latter offering 675 tons of rerolling rails. Certain buyers of the latter assert their belief that the market has gone high enough and that they will refrain from buying, at least for the present. We quote for delivery at buyers' works, Chicago, and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$47.00 to $48.00
Relaying rails	54.50 to 55.00
Old carwheels	43.00 to 45.00
Old steel rails, rerolling	47.00 to 47.50
Old steel rails, less than 3 ft	48.50 to 49.00
Heavy melting steel scrap	39.00 to 41.00
Frogs, switches and guards, cut apart	39.00 to 41.00
Shoveling steel	37.00 to 39.00
Steel axle turnings	26.00 to 27.00

Per Net Ton

Iron angles and splice bars	$47.50 to $48.00
Iron arch bars and transoms	49.50 to 50.00
Steel angle bars	39.50 to 40.00
Iron car axles	54.50 to 55.50
Steel car axles	53.00 to 54.00
No. 1 railroad wrought	44.00 to 45.00
No. 2 railroad wrought	39.50 to 40.00
Cut forge	39.50 to 40.00
Pipes and flues	29.00 to 30.00
No. 1 busheling	34.00 to 35.00
No. 2 busheling	26.00 to 27.00
Steel knuckles and couplers	43.00 to 44.00
Steel springs	44.50 to 45.00
No. 1 boilers, cut to sheets and rings	27.50 to 28.00
Boiler punchings	37.50 to 38.00
Locomotive tires, smooth	50.00 to 50.50
Machine-shop turnings	19.50 to 20.00
Cast borings	19.50 to 20.50
No. 1 cast scrap	32.00 to 33.00
Stove plate and light cast scrap	24.50 to 25.00
Grate bars	26.50 to 27.00
Brake shoes	26.50 to 27.00
Railroad malleable	33.50 to 34.00
Agricultural malleable	29.50 to 30.50

Ferroalloys.—The quotations for domestic 80 per cent ferromanganese are unchanged at $425 to $450 for delivery this year.

Rails and Track Supplies.—No activity is reported beyond a continuance of comparatively minor purchasing of track fastenings.

Quotations are as follows: Standard railroad spikes, 4c. to 4.10c. base; small spikes, 4.25c. to 4.35c., base; track bolts with square nuts, 5c. to 5.10c., all in carloads, Chicago; tie plates, $60 to $70 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open hearth, $40; light rails, 25 to 45 lb., $60; 16 to 20 lb., $61; 12 lb., $62; 8 lb., $63; angle bars, 3.25c., base.

Structural Material.—The structural shops are intensely interested in the Government's shipbuilding program in the hope that it may mean work for them. They are not busy inasmuch as a large part of building work is in the form of concrete or mill construction. An Eastern mill, represented here, is practically out of the market, but for what it can sell quotes 6.189c., Chicago, or 6c., Pittsburgh. For delivery at the mill's convenience 4.50c., Pittsburgh, is still the nominal quotation, but no business is being booked at that level. The leading interest is not quoting at all. It is hoped by structural steel men here that the Government will proceed with the ordering of 100,000 cars as has been suggested. The only award announced this week consists of a 101-ft. single track bridge girder span of 100 tons for the Missouri Pacific Railway Co., which will be supplied by the American Bridge Co.

Jobbers quote 5c. for material out of warehouse.

Bars.—The only source from which a quotation can be obtained places mild steel bars at 4.50c., Pittsburgh, or 4.689c., Chicago, delivery in four or five months and confined to a limited number of sizes. As a rule, tight as the situation is, deliveries in bars are easier than those of other products. Silo manufacturers, who usually take a large tonnage, are endeavoring to place orders. Rail carbon bars range from 4c. to 4.50c., Chicago, the minimum of most of the makers being 4.25c. Iron bars are quoted 4 to 5c., Chicago.

We quote prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c., base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Wire Products.—Independent makers of wire products have advanced their quotation to the basis of 4.50c., Pittsburgh, for wire nails, and all wire products have advanced $10 per ton. The leading interest has not departed from the 3.20c., Pittsburgh, level, but is not selling, and in the matter of specifications is doling out to its customers what it thinks they require. In other words, no one is permitted to accumulate an over-supply. We quote the prices of the independent makers to jobbers, per 100 lb., Pittsburgh:

Plain fence wire, Nos. 6 to 9, base $4.139; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039, all Chicago, carload lots.

Cast-Iron Pipe.—Quotations have been advanced $2 per ton. It is estimated that the Government has placed about 5000 tons for army cantonments, and several thousand tons are yet to be placed, the pipe, in sizes from 12-in. to 24-in., being needed to convey water. One such job called for 2500 tons and another for 1000 tons. Piqua, Ohio, placed 100 tons, but it is likely that bids will be re-opened. Kansas City, Mo., placed 2210 tons, June 13, with R. D. Wood & Co., and 950 tons for the United States Cast Iron Pipe & Foundry Co. On June 26, Livingston, Mont., will award 1500 tons.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $63.50; 6 in. and larger $60.50, with $1 extra for class A water pipe and gas pipe.

Sheets.—Prominent sheet makers are not making any quotations. It is particularly difficult to ascertain the market on galvanized sheets, but No. 28 may be said to range from 10c., Pittsburgh, upward. For No. 10 blue annealed, 8.50c. to 8.75c., Pittsburgh, is named, these being equal to 8.689c. to 8.939c., Chicago. One pass cold rolled black sheets (No. 28) are quoted at 8.939c. to 9.189c., Chicago, by a western mill. Jobbers have advanced their quotations for stock out of warehouse ½c.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9c.; No. 28 black, 9c., and No. 28 galvanized, 11c.

Rivets and Bolts.—In line with its shipbuilding program, the United States Government is about to place direct orders for 40,000 tons of rivets and 25,000 tons of bolts. It is estimated that the 34,000 army wagons which the Government purchased will require about 35,000,000 bolts. Not only is the Government business opening up heavily, but indirect purchases, also for Government uses, are coming from every side. It is expected that the direct purchases of the Government will take about 25 per cent of the bolt and nut production. Meanwhile production is being cut down by the shortage of labor, and it is not at all improbable that private consumers will be asked to pay higher prices

in the near future. Some of them are aware of the situation and are endeavoring to buy heavily with a view of stocking up. A Pittsburgh screw and bolt company announces an advance in structural rivets to $5.25 per 100 lb., base Pittsburgh, and in boiler rivets to $5.35. Jobbers have advanced their quotations on structural and boiler rivets ¼c.

Mill quotations are without change, as follows: Carriage bolts up to ⅝ x 6 in., rolled thread, 40; cut thread, 35-2½; larger sizes, 25; machine bolts up to ⅝ x 4 in., rolled thread, with hot-pressed square nuts, 40-10; cut thread, 40; large size, 30; gimlet-point coach screws, 45; hot-pressed nuts, square, $2.10 off per 100 lb.; hexagon, $1.90 off. Structural rivets, ⅝ to 1¼ in., 5.439c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 5.25c.; boiler rivets, 5.35c.; machine bolts up to ⅝ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅝ x 6 in., 40-2½; larger sizes, 30-5 hot-pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50 per cent off.

Cleveland

CLEVELAND, June 19.

Iron Ore.—A labor shortage has developed in the Lake Superior district and it is estimated that the production of some of the ore properties, particularly on the old ranges, will be cut down 10 to 15 per cent this season. This will mean that some companies that have sold their expected maximum output of ore will be unable to make all their shipments. A few small lot sales are reported. Considerable chartering of boats to bring down wild ore from the head of the Lakes has been done during the past few days at $1.50 free. The ore movement is increasing, but the car situation at lower Lake ports is very serious, apparently having improved little or none since the opening of the iron-ore exchange in Cleveland last week. Coal is not yet moving freely from the mines for shipment up the Lakes and it is expected as soon as this movement is increased there will be marked improvement in the car supply for ore. We quote prices as follows, delivery lower Lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Finished Iron and Steel.—Demand for steel for Government purposes is coming out in considerable volume but inquiry for other purposes is not active in most lines. A contract for the shell forgings for 4,750,000 shrapnel and high explosive 3-in. shells is understood to have been definitely placed with the Hydraulic Pressed Steel Co., Cleveland. A Cleveland manufacturer is inquiring for 7000 tons of billets or blooms for gun forgings. A Pittsburgh district mill has opened its books for third quarter contracts at 4.50c. for steel bars, 6c. for structural material and 10c. for plates. The plate market is very firm, with 10c., Pittsburgh, as the usual quotation for tank plates and as high as 12c. being asked by an Eastern mill. A local mill has sold forging billets at $135 and steel discard rerolled into billets at $95. Local fabricating shops are planning to turn their attention to the manufacture of boat frames for the Government, these to be delivered to Eastern shipyards. Railroads are using their old steel rails and owing to the fact that these are very scarce and high in price mills making hard steel bars have advanced their price to 3.75c. to 4c. Owing to the scarcity of rolling mill scrap and the abnormally high price that this is commanding, local mills are entirely out of the market on iron bars and may decide to shut down. The demand for sheets continues heavy and considerable inquiry is coming out for Government purposes for helmets, ambulance bodies, stoves, munition buildings and for equipment for submarine chasers. The market is very firm at 8.50c. to 9c., Pittsburgh, for No. 28 black; 8c. to 8.75c. for No. 10 blue annealed and 10.50c. to 11c. for No. 28 galvanized, a number of sales being reported at the higher price. Warehouse prices are 5c. for steel bars, 5.25c. for structural material, 9c. for plates, and 8c. for blue annealed sheets.

Pig Iron.—The demand continues fairly active for foundry and malleable iron, but no transactions are reported in steel-making iron. The market is very firm and while there has been no general advance, new price records have been established by sales of foundry and malleable iron by Lake furnaces at $53 for No. 2 for the first half of next year, or $3 a ton higher than previously prevailing prices for that delivery. Sales are reported by a Valley furnace of malleable and foundry iron at $49 and $50 for the first half. Many inquiries from outlying districts are being turned down by Cleveland selling agencies as they have little iron left for delivery for next July. There is an increased number of inquiries for iron for the last half of next year, but these are not being considered. Many foundries are asking furnaces to anticipate shipments in order to accumulate stockpiles. The demand for low phosphorus iron is still active and the market is very firm at $80, at which several sales are reported. The Southern iron market is quite active and prices are higher, the price having been marked up to $42, Birmingham, for No. 2 for the first half of next year. A Cleveland foundry has taken 900 tons at that price and several sales at 300 to 500 tons are reported. For this year a small lot sale is reported at $45, Birmingham, previous to which some business was placed at $44 for No. 2. Buyers are having great difficulty in finding Southern iron for this year. Ohio silvery iron has been advanced $10 more a ton by some sellers, or to $70 at furnace for 8 per cent silicon on sales aggregating 400 tons to a Cleveland consumer for the first half. The sale of 100 tons of silvery, 4 to 5 per cent silicon, is reported at $57, for early shipment, indicating a wide range in prices. We quote f.o.b. Cleveland, as follows, for this year's delivery:

Bessemer	$55.95
Basic	50.30
Northern No. 2 foundry	$50.30 to 53.30
Southern No. 2 foundry	48.00 to 49.00
Gray forge	48.95
Ohio silvery, 8 per cent silicon	66.72 to 71.62
Standard low phos., Valley furnace	80.00

Coke.—The market is very firm with foundry coke quoted at $11 to $12.50 for standard Connellsville makes for prompt shipment, and $10.50 to $11.50 for contract. We note the sale of 1200 tons of foundry coke for shipment during a year from July 1 at $10.50. Few producers are willing to quote contract prices.

Old Material.—The market continues excited with further advances from $2 to $5 per ton on most grades. Dealers now appear to be fairly well covered on short sales but have cleaned out about all the available scrap and in some cases are unable to secure shipments as fast as wanted by the mills. Heavy melting steel is apparently harder to pick up than other grades and this sold as high as $42.50, although most of the transactions reported were at $40 and $41. There is considerable demand for low phosphorus melting stock, which is quoted at $50 to $55, gross, for billet and bloom ends. Steel car axles have sold as high at $57.50, railroad malleable at $39, light bundled sheet scrap at $25, and cast scrap at $31. Busheling is inactive, no sales being reported since recent advances in prices, but this grade is held around $30 and higher. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$44.00 to $45.00
Steel rails, rerolling	48.00 to 50.00
Steel rails, under 3 ft.	47.00 to 50.00
Iron rails	44.00 to 45.00
Steel car axles	55.00 to 57.50
Heavy melting steel	40.00 to 42.00
Carwheels	35.00 to 37.50
Relaying rails, 50 lb. and over	50.00 to 55.00
Agricultural malleable	29.00 to 31.00
Railroad malleable	38.00 to 40.00
Light bundled sheet scrap	24.00 to 25.00

Per Net Ton

Iron car axles	$55.00 to $60.00
Cast borings	19.00 to 20.00
Iron and steel turnings and drillings	18.50 to 19.50
No. 1 busheling (nominal)	29.00 to 30.00
No. 1 railroad wrought	44.00 to 45.00
No. 1 cast	30.00 to 32.00
Railroad grate bars	21.50 to 22.50
Stove plate	19.50 to 20.00

Bolts, Nuts and Rivets.—There is a good demand for bolts and nuts in specifications on contracts, and considerable inquiry for contracts, although manufacturers are holding back on closing. It is very probable an advance will be announced within the next few days. Although some of the rivet manufacturers in the Pitts-

burgh district have made an advance of $5 a ton, none has been made as yet in Cleveland, but local makers will probably mark up prices before the end of the week. The demand is fairly active. We quote rivets at 5c., Pittsburgh, for structural rivets, 5.10c. for boiler rivets for the third quarter delivery. Bolt and nut discounts are as follows:

Common carriage bolts, ⅝ x 6 in., smaller or shorter, rolled thread, 40 off; cut thread, 35 and 2½; larger or longer, 25. Machine bolts, with h. p. nuts, ⅝ x 4 in., smaller or shorter, rolled thread, 40 and 10; cut thread, 40; larger and longer, 30. Lag bolts, cone point, 45. Square h. p. nuts, blank, $2.10 off list; tapped, $1.90 off list. Hexagon, h. p. nuts, blank, $1.90 off; tapped, $1.70 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.40 off; tapped, $1.40 off. Cold pressed semi-finished hexagon nuts, 50 and 10 off.

Cincinnati

CINCINNATI, June 19.

Pig Iron.—The latter part of the week witnessed some heavy advances on both Northern and Southern iron. The Southern furnaces have practically withdrawn from the market and for prompt shipment $45, Birmingham basis, now prevails. Several small lots of resale iron were sold at this figure and in a number of contracts for the entire half the same price was inserted, although several buyers got under cover before the advances were made. Quotations on Northern foundry, malleable and basic for last half shipment are hard to determine. The furnaces in the Hanging Rock district have no iron to offer for this year and one interest there has advanced to $55 Ironton, which may be considered purely a nominal quotation. A few contracts for Northern foundry for first half shipment were made last week at $50 Ironton, but to-day $52 is asked. Prices on Ohio silvery and Bessemer ferrosilicon are also in a chaotic condition. Little of this iron is to be had for this year's shipment. Early last week, some 8 per cent silvery changed hands at $60 furnace, but to-day's quotations range from $70 to $75. Prices from $90 to $100 furnace are made on 10 per cent Bessemer ferrosilicon and several small sized lots for first half shipment have been taken by furnaces during the past few days at $90. Virginia irons quietly invaded the market last week and two 500-ton sales are noted in Michigan and one 500-ton sale in southern Ohio, all for this year's shipment. Virginia No. 2 X is quoted at $48 to $50 furnace. Among sales of Southern iron is one for 2,500 tons to an Ohio consumer for first half shipment, two of 500 tons to Indiana melters and a number of small scattered lots. On the face of it, the inquiry is fairly heavy, but it is multiplied on account of a tendency on the part of customers now to shop around before placing orders. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, as follows:

Southern coke, No. 1 f'dry and 1 soft.	$47.40 to $48.40
Southern coke, No. 2 f'dry and 2 soft.	46.90 to 47.90
Southern coke, No. 3 foundry	46.40 to 47.40
Southern coke, No. 4 foundry	46.00 to 47.00
Southern gray forge	44.90 to 45.90
Ohio silvery, 8 per cent silicon	66.26
Southern Ohio coke, No. 1	$51.76 to 56.76
Southern Ohio coke, No. 2	51.26 to 56.26
Southern Ohio coke, No. 3	50.76 to 55.76
Southern Ohio malleable Bessemer	51.26 to 56.26
Basic, Northern	51.26 to 56.26
Lake Superior charcoal	54.75
Southern carwheel foundry	48.90

Coke.—The unsatisfactory labor situation is said to be one principal cause for the continued high quotations named on both furnace and foundry coke. This is especially true in the Connellsville district. Prompt 48-hr. coke is quoted all the way from $9.50 to $11 and 72-hr. coke from $11.50 to $13 per net ton at oven. These same prices prevail in the Wise County and New River districts, although there is a little furnace coke to be had in the New River field. Pocahontas prices are a trifle easier and would average about 50 cents a ton less. Some prompt foundry iron has been sold lately but there is practically no contracting for either furnace or foundry grades for future shipment.

Finished Material.—No changes are noted in last week's quotations, although jobbers expect to mark up rivets before the end of the week. The local store price on ¼-in. plates and heavier is 9c., and on No. 10 blue annealed sheets 9c. Steel bars are unchanged at 4.65c.; twisted steel bars, 4.70c.; structural shapes, 5c.; machine bolts, ⅝ x 4 in. and smaller, 45 per cent discount; larger and longer, 5 per cent discount; files, 50 per cent discount, and hack saws, 10 per cent discount. The nearby mills quote No. 28 black sheets at 8.15c. Cincinnati or Newport, Ky., and No. 28 galvanized at 10.15c. The high cost of metal roofing material has caused a big demand for composition roofing wherever it can be substituted.

Old Material.—The present excited condition of the market cannot be compared with any previous period of its kind in the history of the business. Prices continue to advance very rapidly, and since Saturday of last week some grades of scrap have been marked up as high as $5 a ton. Heavy relaying rails are in big demand, and will readily bring from $45 to $46 per gross ton, but only a limited tonnage can be found. No. 1 railroad wrought has advanced to $39 per net ton, and is very strong at this figure. Iron axles will bring as high as $48 per net ton. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$24.00 to $24.50
Old iron rails	40.00 to 40.50
Relaying rails, 50 lb. and up	45.50 to 46.00
Rerolling steel rails	42.50 to 43.00
Heavy melting steel rails	40.00 to 40.50
Steel rails for melting	40.00 to 40.50
Old carwheels	36.50 to 37.00

Per Net Ton

No. 1 railroad wrought	$39.00 to $39.50
Cast borings	14.00 to 14.50
Steel turnings	14.00 to 14.50
Railroad cast	29.00 to 29.50
No. 1 machinery cast	30.00 to 30.50
Burnt scrap	17.00 to 17.50
Iron axles	48.00 to 48.50
Locomotive tires (smooth inside)	42.00 to 42.50
Pipes and flues	23.00 to 23.50
Malleable cast	27.50 to 28.00
Railroad tank and sheet	20.50 to 21.00

St. Louis

ST. LOUIS, June 18.

Pig Iron.—Firmness in prices and deliveries has had the effect of keeping out of the market any buying except for definite necessities. Sales made will total probably 2500 tons, mostly of No. 2 Southern for delivery early in 1918. There is some evidence that buyers of basic iron are becoming interested, but they are waiting to determine whether the market price will remain at the present figures or is not likely to recede. The basic buyers are in the position of being able to pass their costs along to the consumer, and therefore are not at the present time specially anxious as to developments.

Coke.—No future prices are being made, and there is no inclination to sell for immediate delivery, except to old customers whose needs are urgent. By-product coke is entirely out of the market because of the sold-up condition of the producers.

Finished Iron and Steel.—No prices are being quoted and none is expected in the present state of the market. Stock in warehouse is still in very active demand, the call being in excess of ability to deliver. For stock out of warehouse we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.25c.; tank plates, 8.05c.; No. 10 blue annealed sheets, 8.55c.; No. 28 black sheets, cold rolled, one pass, 8.85c.; No. 28 galvanized sheets, black sheet gage, 10.75c.

Old Material.—There is now a tendency to be a little more cautious and to avoid speculation because of a fear that the top prices may have been reached. Consuming industries are buying quietly anything that may be offered them that seems at all desirable, and are not making any particular demur as to price. The outside buying has not been so heavy, and dealers seem to have about covered their shortages, for the present at least. The greatest activity in the market is in the steel and cast iron grades, but all the items in the list are commanding the best prices. As has been the case for some weeks, prices quoted are largely nominal because deals continue to be made chiefly upon the needs of the buyer and the stiffness of the seller. No lists of importance made their appearance during the week,

the railroads having about exhausted their current pick-up, at least so far as their car supply will permit. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$45.00 to $46.00
Old steel rails, rerolling	45.00 to 46.50
Old steel rails, less than 3 ft.	39.00 to 40.00
Relaying rails, standard section, subject to inspection	50.00 to 51.00
Old carwheels	34.00 to 35.00
No. 1 railroad heavy melting steel scrap	39.50 to 40.00
Heavy shoveling steel	36.50 to 37.50
Ordinary shoveling steel	35.50 to 36.50
Frogs, switches and guards cut apart	39.50 to 40.00
Ordinary bundled sheet scrap	19.50 to 20.00
Heavy axle and tire turnings	21.00 to 22.00
Per Net Ton	
Iron angle bars	$36.00 to $37.00
Steel angle bars	33.50 to 34.00
Iron car axles	49.00 to 50.00
Steel car axles	47.50 to 48.00
Wrought arch bars and transoms	41.00 to 42.00
No. 1 railroad wrought	39.00 to 40.00
No. 2 railroad wrought	37.00 to 38.00
Railroad springs	33.00 to 34.00
Steel couplers and knuckles	33.00 to 34.00
Locomotive tires, 42 in. and over, smooth inside	45.00 to 46.00
No. 1 dealers' forge	33.00 to 34.00
Cast iron borings	16.50 to 17.00
No. 1 busheling	27.50 to 28.50
No. 1 boilers, cut to sheets and rings	23.00 to 24.00
No. 1 railroad cast scrap	28.00 to 29.00
Stove plate and light cast scrap	17.00 to 18.00
Railroad malleable	27.00 to 28.00
Agricultural malleable	25.00 to 25.50
Pipes and flues	24.00 to 25.00
Heavy railroad sheet and tank scrap	22.00 to 23.00
Railroad grate bars	20.00 to 21.00
Machine shop turnings	18.50 to 19.50

San Francisco

SAN FRANCISCO, June 12.

There is more a feeling of resignation than enthusiasm on the Pacific Coast at present as the result of the war. Business is not as good as reported in but very few lines and it is conceded by the conservative element that it is extremely doubtful whether the reign of high prices will promote general prosperity. In all standard steel products not affected directly by government demands, the volume of tonnage taken is not up to normal. Now that the jobbers and other large dealers have practically exhausted stocks purchased at comparatively low figures, the margins of profit are about on the old basis. Labor costs are considerably higher and the uncertainty of labor and price conditions prevents the launching of all commercial building enterprises which are not absolutely needed at the time. Deliveries of goods from the mills are very slow and the export business is reduced to small proportions. Unless steel products become more available on the Coast, it is difficult to see how this section of the country can share to a very large extent in the Government appropriations for steel ships and other steel manufactured products.

Bars.—The Coast manufacturers still manage to supply their customers with promptness, but sizes made in the East are harder to count on. Bars, however, are not nearly as scarce as most other steel. Prices have advanced again and this week the jobbing lists quote 3-in. and under at 5.75c; over 3-in., 7c; rounds and squares, 3/16 to 5/16-in., 7c; bands, 3/16 and ⅛-in., 7c, and twisted steel and flats, ¼-in. and heavier, 5.75c.

Structural Materials.—The fabricators are fairly busy on small work, but there is a noticeable lack of investment building, nor is it likely that there will spring up any special activity in this line this season. The Liberty loan outlay is heavy and even if materials were not so expensive, the general uncertainty would have a strong tendency to curtail commercial building. The industrial work is encouraging. The Samson Sieve-Grip Tractor Co., Stockton, Cal., expects to double the size of its large plant within six months, and the Union Iron Works has had plans prepared for a new machine shop. A new machine shop is under construction at the Hanlon shipyards of Oakland, also. The Salt Lake Railroad Co. is to erect a $3,000,000 freight terminal in Los Angeles shortly. At Richmond, Cal., the Standard Oil Co. is about to start work on a brick and steel office building to cost $140,000. San Francisco jobbers are quoting angles, channels and tees under 3-in. at 7c; 3 to 15-in., 7.25c, and I beams, 3 to 15-in., 7.25c.

Plates.—Requirements are large, but deliveries to the Coast are still slow and very unsatisfactory both on ship and tank plates. The jobbers complain of inability to meet the running requirements of the regular trade and consequently have only a few sizes in tank plates for a limited export business. Offers of speculators to take complete stocks on hand at premium prices are of course ignored in order to conserve the interests of the regular dealers. In Los Angeles, ¼-in. tank plates are quoted at 10c, but as yet the San Francisco jobbers are selling at 9c, which is the highest figure thus far. A rise is expected any day. It is announced that a new shipbuilding concern, incorporated under the laws of Delaware for $5,000,000, has planned to take over the plants of the Richmond Dredging Co. and the Richmond Machine & Boiler Works, at Richmond, Cal.

Sheets.—The situation is very little better than last month, though several pretty large deliveries from the mills have arrived. The demand is persistent, yet in volume perhaps no more than a normal supply would be required for domestic use. The jobbers are selling Nos. 12 and 14 flat galvanized at 11.17c, and No. 28 at 12.05c. Other sheets have been advanced in proportion.

Wrought Pipes.—No advances have been announced since April 2, and the situation is about the same as formerly. Lap-welded sizes cannot be delivered under 18 months and butt-welded sizes sooner than 14 to 16 weeks. The oil country business is practically called off for the time being, which fact has necessitated the postponement of important oil development work. Jobbers have practically no boiler tubes for export and not enough for local demands in certain goods. Jobbers' stocks on tubular goods of all kinds are said to be much lower than for some years, yet the consuming demand is no more than normal. The main difficulty is on deliveries from the mills.

Cast Iron Pipe.—Large tonnages are scarce, but there is a fairly good volume of small orders from out of stock. The requirements of the Federal and State Governments are large at this time. The latest prices are $66 a ton for 6-in. and larger dimensions, Class B and heavier, and $69 a ton for 4-in., Class B and heavier, with a dollar per ton more for Class A and gas pipe.

Pig Iron.—None is available for last half of this year, but for first half, 1918, the price quoted is $55. All foundries except a very few have been buying liberally on the rising market the past few weeks and are now fairly well covered for the first half of 1918. The Pacific Foundry of San Francisco has installed an electric furnace and is reducing scrap to billets for their foundry requirements.

Coke.—Only a car here and there is being sold, the foundries having not yet begun covering for next year. The price of $23 f.o.b San Francisco is quoted this week.

Old Materials.—Heavy machinery scrap has sold upward of $35 a ton the past week. Mixed country scrap moves readily at about $21.50, light cast steel is quoted as high as $23 and heavy melting scrap is in demand at $26. Dealers predict a comparative shortage in old materials within 60 days.

Buffalo

BUFFALO, June 19.

Pig Iron.—There is no cessation in demand, but orders are desultory and limited, for the reason that scarcely any iron is left for sale in this market for any delivery, the aggregate of sales for the week being under 10,000 tons, for all grades. Prices are advancing steadily. The increase from a week ago averages about $3.00 per ton on the various grades; and while there is no excitement, there is a general and pronounced feeling that prices are likely to keep on rising to

higher levels. High silicon irons now range from $52.00 to $53.00; No. 1 foundry from $51.00 to $53.00 and No. 2 X foundry, also malleable and basic, from $50.00 to $53.00. Very little charcoal iron is procurable and prices have advanced materially. Lake Superior brands now command $55.00 to $60.00 per ton, f.o.b. Buffalo. We quote as follows for prompt and 1917 delivery, f.o.b. furnace, Buffalo:

High silicon irons	$52.00 to $53.00
No. 1 foundry	51.00 to 53.00
No. 2 X, foundry	50.00 to 53.00
No. 2 plain	49.00 to 50.00
No. 3 foundry	49.00
Gray forge	49.00
Malleable	50.00 to 53.00
Basic	50.00 to 53.00
Lake Superior charcoal, f.o.b. Buffalo	55.00 to 60.00

Finished Iron and Steel.—The scarcity of steel products has been emphasized during the week by the practical retirement from the market of the selling agencies of the large independent companies. For this reason, it is difficult to obtain a definite line on prices. For such material as is available, however, mill prices are quoted at 4c. to 4½c. for bars, 4½c. to 6c. for shapes; 10c. for tank plates and 12c. to 15c. for ship building plates. Present warehouse prices, quoted by the leading interest, are: 4.60c. base for bars; 5.10c. for structural shapes and 7.10c. for plates; but from stocks very seriously depleted. Warehousemen representing other producers are quoting much higher prices on plates; prices for bars and shapes are about the same as those of the principal interest. The contract for fabricating and erecting 1000 tons of structural steel for the Federal Government arsenal at Watertown, Mass., has been awarded to the Ferguson Steel & Iron Co., Buffalo.

Old Material.—The market situation remains about the same as a week ago, although a number of commodities have advanced in price from $1 to $2 per ton. Scrap material is growing scarce in many lines and tonnage of any considerable amount is hard to obtain. Deliveries are greatly hampered by reason of shortage of cars and of labor. One or two lots of heavy melting steel has been sold as high as $43, Buffalo, but the general range of quotations on this commodity is $41 to $42. We quote dealers' asking prices per gross ton f.o.b. Buffalo:

Heavy melting steel	$41.00 to $42.00
Low phosphorus	50.00 to 55.00
No. 1 railroad wrought	44.00 to 45.00
No. 1 railroad and machinery cast	30.00 to 31.00
Iron axles	50.00
Steel axles	50.00
Car wheels	34.00 to 36.00
Railroad malleable	34.00 to 35.00
Machine shop turnings	19.00 to 20.00
Heavy axles turnings	22.00 to 23.00
Clean cast borings	19.00 to 20.00
Iron rails	38.00 to 40.00
Locomotive grate bars	21.00 to 22.00
Stove plate	21.00 to 22.00
Wrought pipe	33.00 to 34.00
No. 1 busheling scrap	29.00 to 30.00
No. 2 busheling scrap	20.00 to 21.00
Bundled sheet stamping scrap	22.00 to 23.00

Philadelphia

PHILADELPHIA, June 18.

Proposals to enlist the fabricating shops in this territory for the work of creating an American merchant marine are assuming a more definite form. It is understood that 25 per cent of shop capacity has been requested and that promises have been made by important interests to assist in fabricating standard shapes to be collected at some central point for use in ships which are to be built at the ultimate rate of 20 a month. The proposal to be made to the Government, it is reported here, is to erect 200 standardized 5000-ton steel ships, the fabricating shops to work on the basis of "materials supplied and 10 per cent over." So far the plans are entirely unofficial, but the idea seems to be growing that the Government authorities in charge of furnishing vessels will be inclined to give them a favorable hearing. Their adoption, by adding to the already large tonnage on Government account in the eastern Pennsylvania district, would necessarily mean the setting back of ordinary commercial orders already on the books.

Pig Iron.—The advancing tendency continues, but with a lack of uniformity in prices. Sales of eastern Pennsylvania iron have not been large, but a fair volume of inquiry is reported, with a great deal of interest shown in delivery for first quarter 1918. Some producers say frankly that they are observing no differential in the price on prompt delivery iron and in quotations for first quarter, 1918, though one large firm has announced $48.90 Philadelphia as its price for last quarter 1917 and first quarter 1918, this being about $1 below its price for prompt delivery of eastern Pennsylvania No. 2 X. The week has established $50 iron as a market reality, the whole range of pig iron swinging upward. Virginia irons, which are virtually out of the market in standard grades, continue on a basis of $45 to $46 furnace for No. 2 X, though a sale of special analysis iron, running above 3 per cent silicon, is reported here at $50 furnace. It is understood that this was handled by a Philadelphia office on a New England account. Steel making irons are at a standstill. There have been few transactions reported in basic, and it is impossible to quote very accurately. The most that can be said is that, since the foundry grades have swung upward so decidedly, basic would naturally show a corresponding increase in any transactions at this time and that some buyers are asking $50 Philadelphia. It is reliably reported that an offer equivalent to $47.75 Philadelphia was rejected by one maker within the week. Standard low phosphorus is virtually unobtainable for anything like prompt delivery, and there is a large unsatisfied inquiry for delivery over the remainder of this year. Large sales have been made for delivery over next year at many dollars advance over previous quotations, and the nominal price range is now $90 to $100. Quotations for the standard brands, delivered in buyers' yards, for prompt shipment, range about thus:

Eastern Pa. No. 2X foundry	$49.75 to $50.75
Eastern Pa. No. 2 plain	49.25 to 50.25
Virginia No. 2 X foundry	47.75 to 48.75
Virginia No. 2 plain	47.25 to 48.25
Basic	49.00 to 50.00
Gray forge	44.00
Standard low phosphorus	90.00 to 100.00

Sheets—Sheet mills are virtually sold up for the year, with the prospect of taking on additional work to meet Government military equipment needs. Such little ordinary commercial work as may be taken on, in the shape of odd lots, is now on a minimum of 8½c. Pittsburgh for No. 10 blue annealed.

Coke.—Unsatisfactory conditions still obtain in the coke situation. One house announces $11 for foundry coke on contracts for the year beginning July 1, but other sellers still look askance at contracts. The range for foundry coke, spot, is $12 to $12.50.

Iron and Steel Bars.—Makers of bar iron are facing a strong market, with no relief in the pressure for deliveries. While some makers maintain 4 cents as the nominal price, it is more accurate to say that 4½ to 5c. Pittsburgh is nearer the market, with all business at mill convenience. Some new business is reported at prices ranging up to 6c. Steel bars are held 4½c. Pittsburgh, whether the conditions be mill convenience or third quarter specifications, and as high as 5c. is reported by a large maker on small lots.

Structural Material.—Good tonnages on shapes at 6c. Pittsburgh, to be specified during third quarter, are being contracted for with one of the large mills of this district. Another important Eastern mill has refused third quarter commitments, though fancy prices have been offered and one large inquirer was understood to be willing to accept deliveries extending to 1919. Some small special orders have been accepted at 8c. for prompt delivery.

Plates.—Mills report virtually normal output, with unprecedented demand. The minimum continues at 10c. base, Pittsburgh, for tank steel and 12½c. for boat steel. In some cases, higher figures have been paid. One order for Lloyds' boiler steel, shipment early next year, was taken at 16c. base mill. Good tonnages are reported on recent contracts to be specified during the third quarter, but in some cases at least restriction of tonnage was exercised and acceptances were scaled down to 400 or 500 tons out of each 1000 tons for which

inquiry was made. Mills generally have about all they can do for a year ahead. The Lukens Steel Co. has announced a new list of extras and requirements to be added to the base price of plates, the most important changes being for cutting circles, the extras now being 25 per cent of the base price plus from 0.05c. per pound extra up to 1.55c. per pound.

Ferroalloys.—Ferromanganese has been sluggish, with no change in the quotation of $450 to $460 for prompt. Sales of 50 per cent ferrosilicon at $240 to $250 have been made during the week.

Billets.—Soft open hearth billets have established a new price of $110, that figure being reported in a recent transaction. Forging billets are held at nominal quotations of $115 to $125. Shell discards can be had at $80 Pittsburgh. Semi-finished steel holds to its position of superiority in price to finished product. Wire nails are quoted 4c. base Pittsburgh by an Eastern interest, which at the same time gives a price of $90 Pittsburgh for rods.

Old Materials.—Western demand continues to send up prices in the steel scrap market. The situation has its serious elements, and some dealers fear to sell, owing to the rapid rise. Large dealers in some instances report that they are failing to get delivery on materials sold to them. The lack of open cars and the substitution of box cars in shipping scrap are said to be hampering shipments. Eastern mills are not yet actively in the market, but blast furnaces are using much scrap and visions of a shortage are seen in some quarters. An odd turn in the situation is given by the recent shipment of a carload of scrap from Coatesville to Pittsburgh. There are some handlers of scrap who decline to ship out of eastern Pennsylvania territory, preferring to take a price of $2 to $3 less on No. 1 heavy melting steel, for example, but the actual market now seems to be under the spell of the influences in play at Pittsburgh and western points. Quotations here are still behind the western market, but they are climbing rapidly. Prices based on eastern Pennsylvania delivery, with freight rates running from 50 cents to $1.50 per gross ton, are:

No. 1 heavy melting steel	$37.00 to $38.00
Old steel rails, rerolling	45.00 to 50.00
Low phosphorus heavy melting steel scrap	50.00 to 55.00
Old iron rails	50.00 to 52.00
Old carwheels	35.00 to 37.00
No. 1 railroad wrought	55.00 to 56.00
No. 1 forge fire	25.00 to 27.00
Bundled sheets	25.00 to 27.00
No. 2 busheling	18.00 to 20.00
Machine shop turnings	25.00 to 27.00
Cast borings	25.00 to 27.00
No. 1 cast	32.00 to 35.00
Grate bars, railroad	21.00 to 22.00
Stove plate	21.00 to 22.00
Railroad malleable	32.00 to 33.00
Wrought iron and soft steel pipe (new specification)	38.00 to 40.00

Birmingham

BIRMINGHAM, ALA., June 18.

Cast Iron Pipe.—New business is coming in slowly, but there is enough of fill-in necessity orders from cities and the oil fields to maintain the present standard of output. Now that all cantonments have been chosen, the Government business will be let. Prices will probably rise in the very near future. We quote per net ton, f.o.b. Birmingham district, pipe shop yards as follows: 4-in., $56; 6-in. and upwards, $53, with $1 added for gas pipe and extra lengths.

Coal and Coke.—Alabama miners are being organized in the United Mine Workers of America again, thousands having joined. Good mill steam coal brings from $2.50 to $3.50. There is no change in the coke market. Standard beehive oven makes sell at from $12.50 to $15, the former being contract price and the latter spot.

Pig Iron.—The Birmingham district market is on a basis of $45 for spot, last half, $42 to $43, and first half of 1918, $42.50. During the past week a furnace interest sold small lots of spot at $42.50. Another furnace company sold a melter in the Middle West 300 tons for last quarter at $42.50 and 500 tons for 1918 delivery at $40. Several sales along the same lines were reported. On Thursday of last week, the leading seller of foundry iron advanced its 1918 schedule, which for two weeks had been at $40 to $41, and the last half price was raised from $42 to $43. The leading interest as late as Friday was still quoting 1918 delivery at $40 and sales at that figure were reported. One lot of 500 tons for St. Louis territory for 1918 went at $38, but it was iron on which prior arrangement of price had been made and the price should date back at least a week. Charcoal iron has advanced to $50 per ton. It is more and more difficult to secure spot iron. We quote per gross ton, f.o.b. Birmingham district furnaces, for early delivery, as follows:

No. 1 foundry and soft	$45.50
No. 2 foundry and soft	45.00
No. 3 foundry	44.50
No. 4 foundry	44.25
Gray forge	44.00
Basic	46.00
Charcoal	50.00

Steel Bars.—Steel bars, f.o.b. Birmingham, in car lots, 4.00c. to 4.25c.; iron bars, 3.75c. to 4.00c.

Old Material.—The scrap market is wild. There is a veritable rush on the dealer and he is master of the situation. All sorts of prices are paid under special circumstances. The range is a wide one, but prices as a rule are up from $5 to $7 over a short time back with marked rises during the week. We quote per gross ton, f.o.b. Birmingham dealers' yards, prices to consumers, as follows:

Old steel axles	$45.00 to $45.50
Old steel rails	25.00 to 25.50
No. 1 wrought	28.00 to 29.00
No. 1 heavy melting steel	23.00 to 23.50
No. 1 machinery cast	25.00 to 26.00
Carwheels	25.00 to 26.00
Tram carwheels	20.00 to 20.50
Stove plate and light	16.00 to 16.50
Turnings	13.00 to 13.50

New York

NEW YORK, June 20.

Pig Iron.—The market is in a feverish condition as to prices. As an illustration, the sales of basic by an eastern Pennsylvania furnace may be cited. Last Friday morning, the sale was made at $48, and in the afternoon another sale at $48.50. On Monday, the price was advanced to $50, furnace, and a sale made at that figure. Charcoal iron is now quoted by one Michigan company at $57.50 furnace for next year, and $60 furnace for this year, an advance of from $5 to $8 per ton over recent quotations, but another Michigan company quotes $50 to $55 furnace. Among the inquiries pending are two from New Jersey, one being for 5000 tons of basic and the other for 2000 tons of foundry, both for delivery the first half of next year. Alabama iron is very strong, and it is doubtful whether $45 furnace for No. 2 foundry for delivery this year, or $42 furnace for next year, could be shaded. Prices on Virginia iron are unsettled, and very few sales are being made. We quote tidewater for early delivery as follows:

No. 1 foundry	$49.25 to $50.25
No. 2 X	48.75 to 49.75
No. 2 plain	48.25 to 49.25
Southern No. 1 foundry	49.75
Southern No. 2 foundry and soft	49.25

Ferroalloys.—Prospects do not seem as favorable as they were a few weeks ago for the shipment of 6000 tons per month of British ferromanganese to this country. From data already furnished THE IRON AGE, but not yet complete, receipts in May probably did not exceed 3000 tons, and the indications are that those for June will not reach the 6000-ton mark. While the shipping situation is given as one cause for this, there is the view that the alloy is not as plentiful for release to this country as expected. One dealer has sold several hundred tons of British product for delivery in the six months beginning with October, but the price is not stated. In general the market is quiet but firm, with inquiries not large in number or volume and sales very few. For this year the quotation ranges from $400 to $450, delivered, on domestic alloy. It is reported, but not confirmed, that a sale has been made for delivery next year at $375 delivered. Spiegeleisen, 20 per cent,

as sold recently as high as $87.50, furnace, for spot delivery, with the quotation for any delivery this year at $80 to $85, furnace. About 8000 tons of foreign spiegeleisen has been recently sold at about $85, seaboard, one consumer taking 6000 tons. A large dealer in 50 per cent ferrosilicon announces that it can be obtained for the first half of 1918 at $130, delivered, or much below the present range of $200 to $250, delivered, in the last half of this year.

Steel Plates.—Export demand, particularly from Japan, is clearly a leading cause for the rapid upbidding of prices and apparently tank plates are accepted for shipbuilding purposes as eagerly as plates rolled to Lloyd's specifications. The sale of 1000 tons at 9.50c., Pittsburgh base, for immediate shipment is noted and 5000 tons at 8.50c. for the first quarter of 1918. It is difficult to establish a definite market price to a domestic consumer for a large lot in moderately prompt shipment, but at this writing 2500 tons for prompt shipment is under negotiation at a price of 8.75c., Pittsburg. The export lots, snapped up without much question as to price, are hardly a criterion for domestic business. Small lots buyers do a considerable amount of shopping and haggle considerably over the price, in considerable contrast to the large buyers who make quick decisions at prices named by mills. A sale of 100 gross tons to a jobber for delivery in two or three months is noted at 9c. Some 20,000 tons for the first half of 1918 for a domestic consumer is under consideration at 10.50c. On export shipments, 15c. and even 20c. per lb. are talked of as ruling before the end of the year. Nothing has developed in railroad car business. It is not expected that any buying in volume will ensue until it is clear that the Government does not provide for buying the 100,000 cars under consideration several weeks. Owing to the considerable amount of money involved, special Congressional legislation will be necessary, and if cars are to be furnished in this way, the railroads doubtless will not be heavy purchasers in the immediate future. Some of the buying has been for tank cars, but so well filled up have these departments at car works been that deliveries will probably extend considerably into 1918. Some other car construction has been abandoned, notably that for the Northern Pacific, which found prices on center constructions for 500 to 1000 box cars too high. On mill shipments of universal and tank plates the range is 8.169c. to 9.169c., New York, with tank plates probably a minimum at 8.669c. and ship plates higher than 10c. Pittsburgh basis rather than lower. Plates out of store are 8c. to 9c, and even as high as 11c., New York.

Iron and Steel Bars.—Manufacturing consumers and jobbers are showing considerable concern over their future supplies, in view of the increased quantity of steel which it seems likely will be taken by our own and the Allies' governments. Efforts to secure mill protection are not meeting with much success. Distribution by the American Iron and Steel Institute's committee has been made of the shell steel, amounting to some 80,000 tons for the 9,000,000 3-in. shells for the United States Government, but it is not clear that the contracts have actually been signed or that the price has been fixed, although 3.75c. is mentioned. The strength of the bar iron market is indicated by an advance by at least one producer to 4.50c. per lb., Pittsburgh, and indications that 4c., Pittsburgh, has about disappeared. Some contracting at the top price, with irrevocable provisions, has already been made for the third quarter and more is under consideration. We quote steel bars in mill shipments at 4.419c. to 4.669c., New York, and iron bars at 4.419c to 4.669c., New York From New York district warehouses iron bars are sold at 4.75c. and steel bars at 4.75c to 5c.

Structural Material.—Government orders continue to be the only active factor in this market, orders outside of these amounting to almost nothing. The American Bridge Co. has taken 3000 tons for a foundry building for League Island Navy Yard, 3000 tons for a new structural shop and 800 tons for a machine shop for the Brooklyn Navy Yard, 300 tons for a power house at a training station at Newport, R. I., and 900 tons for a new rolling mill for the Baltimore Tube Co. at Baltimore, Md. The McClintic-Marshall Co. has taken 8000 tons for new shipways and crane runways and 1100 tons for a turbine shop for the Newport News Shipbuilding & Dry Dock Co. The Belmont Iron Works has taken 2800 tons for the new plant of the Baltimore Dry Dock & Shipbuilding Co. The Virginia Bridge Co. was the successful bidder for the 500 tons necessary for a new municipal pier at Norfolk, Va., and for the 600 tons for double tracking viaducts for the Virginian Railway, the original proposition, calling for 1100 tons, having been cut down. The Government took bids yesterday on 600 tons for 14 small buildings for the Bureau of Yards and Docks and on Monday bids will be taken on 2100 tons for small buildings to be located in various parts of the country for the same department of the Government. The Pennsylvania Railroad has issued inquiries on 300 tons for bridge work. We quote plain material from mill at 4.419c. to 4.919c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. Shipments from warehouses are 5c to 5.25c. per pound, New York.

Cast Iron Pipe.—Municipalities are showing more interest in the market, but the only inquiry on which bids have been received this week was one for 500 tons at Yonkers. The award has not yet been made. Prices have been advanced $2 per ton. Carload lots of 6-in., class B and heavier, are now quoted at $60.50 per net ton, tidewater, with class A and gas pipe taking an extra of $1 per ton.

Old Material.—Activity in the Pittsburgh and Youngstown districts continues to exercise an important influence in the East. For heavy melting steel with a freight rate of $2.76 from New York to Pittsburgh, New York brokers have paid as high as $41 to $42 New York. Some brokers who are short are having difficulty in buying. The demand for wrought scrap is still very active, and quotations on wrought iron pipe have again been advanced. Brokers quote buying prices as follows to local dealers and producers, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$29.00 to $30.00
Old steel rails (short lengths) or equivalent heavy steel scrap	41.00 to 42.00
Relaying rails	60.00 to 65.00
Rerolling rails	44.00 to 45.00
Iron and steel car axles	54.00 to 55.00
No. 1 railroad wrought	50.00 to 51.00
Wrought-iron track scrap	46.00 to 47.00
No. 1 yard wrought, long	42.00 to 43.00
Light iron	14.00 to 15.00
Cast borings (clean)	22.00 to 23.00
Machine-shop turnings	21.50 to 22.00
Mixed borings and turnings	18.00 to 18.50
Wrought-iron pipe (1 in. min. diameter, not under 2 ft. long)	36.00 to 37.00

Foundry scrap is strong, but not as active as steel mill material. Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton, New York:

No. 1 machinery cast	$35.00 to $36.00
No. 1 heavy cast (column, building material, etc.)	34.00 to 35.00
No. 2 cast (radiators, cast boilers, etc.)	29.00 to 30.00
Stove plate	22.00 to 23.00
Locomotive grate bars	22.00 to 23.00
Old carwheels	34.00 to 35.00
Malleable cast (railroad)	32.00 to 33.00

Will Soon Blow In

CHICAGO, June 20.—(*By Wire*).—The Bird Coal & Iron Co., Chicago, expects to have its furnace at Talladega, Ala., in blast inside of eight weeks. The stack has been raised and a new lining is on the ground. Many repairs have been made since April, when work was started. Its coal lands at Coal City are being worked, also its iron mine. Its coke ovens are being warmed up. E. J. Bird is president. The company will produce 200 tons per day with present equipment.

The Wharton Steel Company, Wharton, N. J., is planning for the early operation of its iron ore properties at Hibernia, Morris County. The workings are being improved to the tunnel level, and new pumping equipment installed.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
June	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
13	32.50	32.50	60.75	12.00	11.75	9.75	9.50
14	32.50	32.50	61.25	11.87½	11.62½	9.75	9.50
15	32.50	32.50	61.75	11.87½	11.62½	9.75	9.50
16	32.50	32.50	....	11.87½	11.62½	9.75	9.50
18	32.50	32.50	64.00	11.87½	11.62½	9.75	9.50
19	32.50	32.50	63.50	11.75	11.50	9.75	9.50

NEW YORK, June 20, 1917.

The market continues a waiting one, with the metals generally dull and inactive. Copper is more or less nominal, but fairly strong. Tin continues rather inactive, but is higher. Lead has declined slightly, but is still very strong. Spelter could hardly be more inactive, but continues to be steady. Antimony has again declined.

New York

Copper.—It is stated that copper is being delivered to the Government on recent orders at 28c. per lb., but any definite information regarding the exact status of the matter is difficult to obtain. It is understood, however, that this price is not an actual one, but is being used for billing purposes only, and that later the actual price to be paid will be settled. Even those who a short time ago were skeptical as to the Government paying any more than 16 2/3c. per lb. are now acknowledging the likelihood of nothing less than 25c. as the buying figure. Transactions continue in small volume for most positions, and the quotation for early delivery Lake or electrolytic continues at 32.50c. New York, but this is more or less nominal, and, as before, the metal is obtainable only from second hands or small producers. The quotation for third quarter continues at 30.50c. to 31.50c., and the last quarter at 29c. to 29.50c. The last cable received from London on June 15 shows no change in spot electrolytic at £142.

Tin.—In the absence of cables from London to the New York Metal Exchange this week, buyers and sellers are more or less at sea. No explanation is offered as to why these cables have not arrived, and as a result demand has fallen off, buyers are shy and sellers are restless, with the market at practically a halt. Private cables to one or two parties were to the effect that the market had advanced £8 or more and as a result the quotation in New York yesterday was more or less nominal at 63.50c., with the price at 64c. on Monday, an advance of nearly 3c. since last week. In futures a moderate business has been very quietly done, with a few consumers the purchasers. Late last week August and September shipments from the East sold as low as 54.75c. on June 13, and as high as 56.25c. on June 15. Further information regarding the progress of negotiations between the Government and the committee of the tin trade is not available. Up to June 19 inclusive the arrivals were 1095 tons, with the quantity afloat at 3156 tons.

Lead.—As a result of negotiations in the past 10 days between the Government and the lead producers it is understood that a price of 8c. per lb. was agreed upon, but that the quantity to fill Government and other needs was not settled. It seems apparent, however, that this will be considerably less than at first estimated, and 15,000 tons has been named as one figure. At any rate, some producers have been willing to part with some of their metal in the last few days, which is taken to indicate that the foregoing supposition is correct because these dealers have been holding the metal until they knew something definite. The market has also receded slightly, which is advanced as a further argument, and metal for early delivery is now quoted at 11.75c., New York, and 11.50c., St. Louis, a decline of about ¼c. since a week ago. In general the market has been very much quieter the past week than for some time, with a considerable falling off in sales. The quotation of the American Smelting & Refining Co. is unchanged at 11c., New York.

Spelter.—The market continues in its stagnant but firm condition with futures a little higher if anything than nearby deliveries. The latter continue to be quoted by leading dealers at 9.37½c., St. Louis, or 9.62½c., New York, while future deliveries command 9.50c., St. Louis, or 9.75c., New York. These prices could perhaps be shaded on desirable offers. Large dealers insist on their belief that a more active demand will develop in the not distant future and are firm in maintaining present prices. If some definite information could be obtained regarding the Government's buying, the entire situation would be at once clarified. Spelter exports for April are reported as 10,814 tons, against 22,712 tons in March.

Antimony.—The market is quiet with demand at a low ebb for prompt or June delivery of Chinese or Japanese metal which has further receded to 19c. to 20c. per lb. Futures are exciting more interest.

Aluminum.—The statement is made that the Government's requirements for aluminum are to be met at 27.50c. per lb., this figure being arrived at by taking the average price for the past 10 years and adding 2c. per lb. Demand is quiet and No. 1 virgin metal, 98 to 99 per cent pure, is quoted at 59c. to 61c., New York.

Old Metals, New York.—The market is quiet with the exception of lead, which is strong, and dealers' buying prices are as follows:

	Cents per lb.
Copper, heavy and crucible	28.50
Copper, heavy and wire	27.50
Copper, light and bottoms	27.50 to 28.00
Brass, heavy	20.75 to 21.25
Brass, light	15.75 to 16.25
Heavy machine composition	27.00 to 27.25
No. 1 yellow rod brass turnings	19.50
No. 1 red brass or composition turnings	21.50 to 22.50
Lead, heavy	10.25
Lead, tea	9.00
Zinc	7.25

Chicago

JUNE 18.—Though comparatively quiet, business being confined mostly to single carload lots, the market in copper is strong. Rather unexpectedly, tin prices have taken a turn upward. An advance was not considered likely in view of Government regulations, although the demand has been healthy. The lead market has been marking time; consumers in urgent need have paid up to 13c., but for nearby delivery 12c. to 12.50c. can be done. Spelter is weak. The quotations for antimony show a further decline. We quote as follows: Casting copper, 31c.; Lake, 31.50c. to 31.75c.; electrolytic, 32.75c. to 33c.; tin, carloads, 63.50c.; small lots, 65c. to 66c.; lead, 12c. to 12.50c.; spelter, 9.37½c.; sheet zinc, 19c.; Oriental antimony, 22.50c. to 24c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 27c.; copper clips, 26.50c.; copper bottoms, 24.5c.; red brass, 24c.; yellow brass, 18c.; lead pipe, 8.75c.; zinc, 6.50c.; pewter, No. 1, 35c.; tinfoil, 42.50c.; block tin, 47.50c.

St. Louis

JUNE 18.—The non-ferrous metals have been rather quiet, though they have held up well in price. In less than carload lots we quote as follows, as of the close to-day: Lead, 13c.; spelter, 10.50c.; Lake copper, 33.50c.; electrolytic copper, 33c.; Asiatic antimony, 25c. In carload lots for lead the price was 12.50c. and for spelter 9.50c. In the Joplin district lead ore maintained its firmness and sold up to $130 per ton, basis of 80 per cent metal. The average for the week for the district was also $130 because of the premium grade sales. In zinc blende the range for the week was $70 to $80 per ton, for 60 per cent metals, with the average for the week for the district at $76 per ton. In calamine the price range was $38 to $45 per ton, with the average for the week at $41 per ton. The producers of zinc are continuing to hold much of their product for higher prices and a stiffening of the market is beginning to be felt. Lead ore production is being pushed to the utmost and is gaining with every week. On miscellaneous scrap metals we quote dealers' buying prices as follows: Lead, 7c.; zinc, 6c.; tea lead, 4c.; light brass, 12c.; heavy yellow brass, 13c.; heavy red brass and light copper, 20c.; heavy copper and copper wire, 22.50c.; tinfoil, 40c.; pewter, 25c.

IRON AND INDUSTRIAL STOCKS

Many Fluctuations Last Week—Attitude of Government on Prices Has Effect

Many fluctuations characterized the stock market last week, but the gains and losses nearly balanced. In view of the fact that subscriptions to the Liberty loan last week were tremendous and that withdrawals from banks in order to make payments on subscriptions must have been considerable, it was rather surprising that the market stood up as well as it did. A factor which has had a depressing influence has been the feeling that the Government buying of large quantities of iron and steel at less than regular market prices will be reflected in earnings not as great as they would otherwise be. Activity in Steel common continued last week, the sales amounting to 1,342,100 shares and this stock registered a net loss of ⅞ of a point, while Steel preferred gained ½ point. Republic Iron & Steel lost ⅞ and Baldwin Locomotive 1½, while Pressed Steel Car also registered a loss of 1½. American Locomotive lost 2½ points, but Lackawanna Steel gained ⅝ and Bethlehem Steel registered a gain of 3½.

The market started in Monday of this week with sharp declines and United States Steel common, on sales of 212,900 shares, lost 3¼ points. Republic and Bethlehem also declined sharply. Transactions were smaller than for a number of weeks. This fact was generally attributed to the maintenance of the 6 per cent call money rate. Tuesday many stocks receded slightly, but the prevailing sentiment was not so gloomy as on the preceding day.

The range of prices on active iron and industrial stocks from Wednesday of last to Tuesday of this week was as follows:

Allis-Chal., com..	27 - 29½	Int. Har. of N. J., com.	113 -118
Allis-Chal., pref..	85½ - 86⅝	Int. Har. Corp., com.	68 - 71
Am. Can, com...	47¼ - 51¼	Int. Har. Corp., pref.	102¾
Am. Can, pref...	105½ - 111½	Lackawanna Stl..	94¼ - 103⅝
Am. Car & Fdy., com.	71⅝ - 75	Lake Sup. Corp..	19½ - 22
Am. Loco., com..	69¼ - 73⅞	Lima Loco.	53
Am. Loco., pref.	105	Lukens, com.	43 - 45
Am. Ship, com...	79 - 86	Midvale Steel	62 - 65½
Am. Ship, pref...	94½ - 95	Nat.-Acme	31⅜ - 36
Am. Steel Fdries.	71 - 74½	Nat. En. & Stm., com.	38⅛ - 41⅝
Bald. Loco., com.	61½ - 67½	N. Y. Air Brake..	146 -152½
Bald. Loco., pref.	100	Nova Scotia Steel	96 -108
Beth. Steel, com..	145¼ - 157½	Pressed Stl., com.	75 - 79½
Beth. Steel, class B	139 -155½	Pressed Stl., pref.	102½
Cambria Steel....	160 -163	Ry. Steel Spring, com.	52½ - 56⅞
Carbon Steel, com.	102 -105	Republic, com. ..	88¼ - 93½
Case (J. I.), pref.	83¼ - 85	Republic, pref. ..	103⅞ - 105½
Central Fdry., com.	34 - 36⅜	Sloss, com.	58 - 62⅛
Central Fdry., pref.	54½ - 57	Sloss, pref.	95
Charcoal Iron, com.	8¼ - 9¼	Sup. Steel	45¼ - 49⅜
Chic. Pneu. Tool	74¾ - 77½	Superior Steel, 1st pref	101
Colo. Fuel	50 - 55½	Transue-Williams	46
Cruc. Steel, com..	79 - 82¾	Un. Alloy Steel..	44½ - 47½
Cruc. Steel, pref..	105 -107½	U. S. Pipe, com..	21 - 22½
Deere & Co., pref.	99 -100	U. S. Pipe, pref..	54 - 56
Gen. Electric....	157⅝ - 162⅝	U. S. Steel, com..	126¾ - 134⅝
Gt. No. Ore Cert.	32⅛ - 33⅞	U. S. Steel, pref..	117¼ - 117⅞
Gulf States Steel.	123 -128	Va. I. Co. & Coke	68½ - 74
Gulf States Steel, 1st pref.	110	Warwick	9 - 9¼
		Westing. Elec....	50⅞ - 53½

Dominion Steel Meeting

The annual meeting of the Dominion Steel Corporation was held in Montreal June 14. President Mark Workman reported that last year's sales constituted a record. He warned the shareholders to prepare for a readjustment after peace was signed, though the company's order books at this time showed a greater unfilled tonnage than at any time in its history and is almost twice as great as last year. The old board of directors was re-elected. The annual financial statement showed net earnings to be $9,581,165. The sum of $1,859,595 was placed to the depreciation account and $8,571,165 to surplus account. All dividends including arrears were met. The balance on March 31, 1917, was $11,937,577. "We are booked up in steel products to the end of the calendar year," President Workman stated, "and in addition to that our shell steel output for the first six months of 1918 has been disposed of." Mr. Workman reviewed in some detail the improvement in the financial position of the corporation effected in the past year by the retirement of notes, etc., and the elimination from the balance sheet of the item of $2,900,000 "discounts and premiums on securities" which involved a recurring annual charge of about $225,000. As to physical improvements at the plants the remodeling of the blast furnace departments was making progress and two batteries of new by-product coke ovens were being installed which would result in lower coke costs, while permitting of the utilization of the company's total blast furnace capacity, which is now greater than can be taken care of owing to the limited coke production. Difficulties in the coal department due to scarcity of labor and ships were dealt with in some detail.

Industrial Finances

The Terry Shipbuilding Corporation, which, as announced in THE IRON AGE last week, has a contract to build 20 steel composite ships for the Emergency Fleet Corporation, has been incorporated under the laws of New York State, with active capital of $100,000. There are 20,000 shares of common stock. The incorporators are F. Tench, H. F. John and G. O. Wagner, all of Grand Central Terminal building, New York.

The Grahan Bros. Sales Co. of New York, Inc., has been incorporated in New York State to manufacture automobiles and other motor vehicles, the active capital being $31,500. There are 300 shares of preferred stock of $100 par value and 300 shares of common stock of no par value. W. O. Crabtree, F. R. Valtey and W. Lewis, 1417 Broadway, New York, are the incorporators.

The Detroit Steel Products Co. has filed a charter in New Jersey and has established a warehouse in Jersey City. The capital stock is $1,250,000. John G. Rumney is president and Harold F. Wardell secretary.

The American U-Boat and Aero Corporation is the name of a $3,000,000 concern which has been organized and incorporated under the laws of Delaware to build and operate boats and airplanes. A. M. Holloran, M. H. Morris and Farris Giles, all of Wilmington, Del., are the incorporators.

Dividends

The American Brake Shoe & Foundry Co., quarterly, 1¾ per cent on the common and 2 per cent on the preferred, also extra 1 per cent and extra 5 per cent, payable in Liberty bonds, on the preferred, all payable June 30. A dividend of 1 per cent on the preferred, as a special contribution to the American Red Cross, has also been declared.

The American Machine & Foundry Co., 5 per cent, payable July 14.

The American Seeding Machine Co., quarterly, 1 per cent on the common and 1½ per cent on the preferred, payable July 15.

The American Type Founders, quarterly, 1 per cent on the common and 1¾ per cent on the preferred, payable July 14.

The Canadian Locomotives, Ltd., quarterly, 1¾ per cent on the preferred, payable July 1.

The Empire Steel & Iron Co., 3 per cent on the preferred and extra 3 per cent, payable July 2.

The Great Northern Iron Ore Properties, 50c. per share, payable July 10.

The Gulf States Steel Co., 1 per cent on the common as a special contribution to the American Red Cross.

The International Harvester Co. of New Jersey, quarterly, 1¼ per cent on the common, payable July 16.

The Standard Screw Co., 6 per cent on the common, payable July 1.

The Sloss-Sheffield Steel & Iron Co., quarterly, 1¾ per cent on the preferred, payable July 2.

The Steel Co. of Canada, Ltd., quarterly, 1 per cent and a bonus of ½ per cent on the common, and quarterly 1¾ per cent on the preferred, all payable Aug. 1.

The Trumbull Steel Co., quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, payable July 1.

The Underwood Typewriter Co., quarterly, 1½ per cent on the common and 1¾ per cent on the preferred, payable Oct. 1.

The United Shoe Machinery Co., quarterly, 50c. per share, and $1 per share, payable in Liberty bonds, and $2.50 per share payable in common stock, all on the common, and quarterly 37½c. on the preferred, all payable July 5.

The Valley Mold & Iron Co., initial quarterly, 1¾ per cent on the preferred.

The Washburn Wire Co., quarterly, 2 per cent on the common and 1¾ per cent on the preferred, payable June 25.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 83.6c., minimum carload, 36,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 50,000 lb.; structural steel and steel bars, 80c., minimum carload, 40,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 4.50c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Plates.—Tank plates, ¼ in. thick, 6 in. up to 100 in. wide, 8c. base, net cash, 30 days, or ½ of 1 per cent discount in 10 days, carload lots. Extras are:

Quality Extras

	Cents per lb.
Tank steel	Base
Pressing steel (not flange steel for boilers)	.10
Boiler and flange steel plates	.15
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Locomotive firebox steel	.50

Marine steel, special extras and prices on application.

Gage Extras

Rectangular, ¼ in. thick, over 6 in. wide to 100 in. wide	Base
Lighter than ¼ in., to 3/16 in., up to 72 in. wide	.10
*Lighter than ¼ in., including 3/16 in., over 72 in. to 84	.20
*Lighter than ¼ in., including 3/16 in., over 84 in. to 96	.30
*Lighter than ¼ in., including 3/16 in., over 96 in. to 100	.40
*Lighter than ¼ in., including 3/16 in., over 100 in. to 102	.45
Lighter than 3/16 in., including No. 8, up to 72 in. wide	.15
*Lighter than 3/16 in., including No. 8, over 72 in. to 84	.25
*Lighter than 3/16 in., including No. 8, over 84 in. to 96	.35
Lighter than No. 8, including No. 10, up to 60 in. wide	.30
Lighter than No. 8, including No. 10, over 60 in. to 64	.35

Up to 72 in. and not less than 10.2 lb. per sq. ft. will be considered ¼ in.
Over 72 in. must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft. to take base price.
Over 72 in. wide, ordered less than 11 lb. per sq. ft., down to weight of 3/16 in., take price of 3/16 in.
Over 72 in., ordered weight 3/16 in., take No. 8 price.
Over 72 in., ordered weight No. 8, take No. 10 price.

Width Extras

Over 100 in. to 110 in. inclusive	.05
Over 110 in. to 115 in. inclusive	.10
Over 115 in. to 120 in. inclusive	.15
Over 120 in. to 125 in. inclusive	.25
Over 125 in. to 130 in. inclusive	.50
Over 130 in.	1.00

Length Extras

Universal plates 80 ft. long up to 90 ft. long	.05
Universal plates 90 ft. long up to 100 ft. long	.10
Universal plates 100 ft. long up to 110 ft. long	.20

Cutting Extras

No charge for rectangular plates to lengths 3 ft. and over.	
Lengths under 3 ft. to 2 ft. inclusive	.25
Lengths under 2 ft. to 1 ft. inclusive	.50
Lengths under 1 ft.	1.55
Circles 3 ft. in diameter to 100 in.	.30
Circles over 100 to 110 in. (width extra)	.35
Circles over 110 to 115 in. (width extra)	.40
Circles over 115 to 120 in. (width extra)	.45
Circles over 120 to 125 in. (width extra)	.55
Circles over 125 to 130 in. (width extra)	.80
Circles over 130 in. (width extra)	1.30
Circles under 3 ft., to 2 ft., inclusive	.55
Circles under 2 ft., to 1 ft., inclusive	.80
Circles under 1 ft.	1.85
Half circles take circle extras.	
Sketches not over four straight cuts, inc. straight taper	.10
Sketches having more than four straight cuts	.20
Plates sheared to a radius take complete circle extras.	

*Including extra for width.

Wire Rods.—Including chain rods, $95.

Wire Products.—Prices to jobbers, effective April 20: Fence wire Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, $3.45; galvanized, $4.15. Galvanized barb wire and staples, $4.35; painted, $3.65. Wire nails, $4. Galvanized nails, 1 in. and longer, $2.20 advance over base price; shorter than 1 in., $2.70 advance over base price. Cement coated nails, $3.90. Woven wire-fencing, 43 per cent off list for carloads, 42 off for 1000-rod lots, 41 off for less than 1000-rod lots.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from May 1, 1917, all full weight:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	30	2
½	46	31½	⅜	31	4
¾ to 3	49	35½	½	35	17
			¾ to 1½	38	22

Lap Weld

2	42	29½	1¼	23	8
2½ to 6	45	32½	1½	30	18
7 to 12	42	28½	2	31	17
13 and 14	32½	..	2½ to 4	33	20
15	30	..	4½ to 6	33	20
			7 to 12	32	19

Butt Weld, extra strong, plain ends

¼, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	29	12
½	43	30½	½	34	21
¾ to 1½	47	34½	¾ to 1½	38	23
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	1¼	24	9
2½ to 4	43	31½	1½	30	18
4½ to 6	42	30½	2	32	19
7 to 8	38	24½	2½ to 4	34	22
9 to 12	33	19½	4½ to 6	33	21
			7 to 8	27	15
			9 to 12	22	10

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes.—Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

	Cents per lb.
Blue Annealed—Bessemer	
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	7.80 to 8.30
Nos. 22 and 24	7.85 to 8.35
Nos. 25 and 26	7.90 to 8.40
No. 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.15 to 8.65
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	8.75 to 9.25
Nos. 12 and 14	8.85 to 9.35
Nos. 15 and 16	9.00 to 9.50
Nos. 17 to 21	9.15 to 9.65
Nos. 22 and 24	9.30 to 9.80
Nos. 25 and 26	9.45 to 9.95
No. 27	9.60 to 10.10
No. 28	9.75 to 10.25
No. 29	10.00 to 10.50
No. 30	10.25 to 10.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	7.30 to 7.80
Nos. 17 to 21	7.35 to 7.85
Nos. 22 to 24	7.40 to 7.90
Nos. 25 to 27	7.45 to 7.95
No. 28	7.50 to 8.00
No. 29	7.55 to 8.05
No. 30	7.55 to 8.05
Nos. 30½ and 31	7.60 to 8.10

PERSONAL

Col. H. P. Bope, vice-president and general manager of sales, Carnegie Steel Co., Pittsburgh, delivered an address in that city before the Pittsburgh Commercial Club, his subject being "Patriotism as Illustrated in American History."

George O. Nagle, president of the West Virginia Manufacturers' Association, has been elected City Manager of Wheeling, under the commission form of government, which becomes effective July 1.

Leonard B. Miller, of Oglebay, Norton & Co., Cleveland, after an illness of nearly three months in a hospital at Daytona, Fla., has been taken to Cleveland and is now in Charity Hospital. His condition is critical.

R. E. Uptegraff has been appointed designing engineer in the transformer department of the Packard Electric Co., Warren, Ohio. He will still carry on his work as a member of the B. Rutherford Co., consulting engineer, Pittsburgh.

John P. Elton, American Brass Co., Waterbury; A. H. Bullard, Bullard Machine Tool Co., Bridgeport; De Witt Page, United Motors Co., Bristol, and Philip B. Gale, Standard Screw Co., have been appointed by Governor Holcomb to represent Connecticut metalworking industries on the New England Coal Committee.

John N. Willys, president of Willys-Overland Company, Toledo, Ohio, who is having a yacht, 288 ft. long and to have a speed of 30 knots, built by the Bath Iron Works, Bath, Me., has notified the company to discontinue fitting out the yacht as a pleasure boat, as he is to turn it over to the Government.

H. H. S. Handy, vice-president of the Semet-Solvay Co., Solvay, N. Y., has been appointed a member of the committee on coal tar by-products of the Council of National Defense.

Jacob L. Mueller, formerly metallurgist of the Springfield Facing Co., Springfield, Mass., has been appointed mechanical engineer with the American Chain Co., Inc., Bridgeport, Conn.

Louis H. Mesker, who was until recently sales manager of the Kearney & Trecker Co., Milwaukee, Wis., has become associated with the Cleveland Milling Machine Co., Cleveland.

Robert H. Wallace has been appointed shop superintendent of the Bailey Meter Co., Boston. He was formerly experimental engineer with the Remington Arms & Ammunition Co., Bridgeport, Conn.

Frank H. Schubart has been appointed assistant chief engineer of power plants of the Union Electric Light & Power Co., St. Louis. Until recently he was district manager for the Wheeler Condenser & Engineering Co., in that city.

George H. Jewell, formerly manager of sales for the Lytton Mfg. Corporation, Chicago, has become identified with the office of the Builders' Iron Foundry in that city.

Robert W. Ellingham, formerly assistant superintendent of the Remington Arms & Ammunition Co., Bridgeport, has become affiliated with the Bilton Machine Tool Co., that city, a new corporation formed by the consolidation of the Standard Mfg. Co. and the Parsons Foundry Co.

Dr. Henry M. Howe has been elected a member of the National Academy of Sciences, a distinction, as new members are chosen from the distinguished men of science of the United States, the Academy being comparable to the Royal Society of London.

John Bertram, formerly president of Topping Brothers, jobbers of heavy and marine hardware and railroad and contractors' supplies, 122 Chambers Street, New York, is now chairman of the board of directors of the company. George A. Wesson, formerly vice-president and general manager, is now president. James H. Browning has been elected vice-president. Walter C. Douglas, formerly secretary, is now also a vice-president, but he has retired from the board in anticipation of a protracted absence from the country, having volunteered for service in the Army. Former Treasurer Herbert Edge is now secretary and treasurer and George H. Court has been elected sales manager, succeeding Mr. Douglas. The changes were made at a special meeting of the board held June 14.

Van Buren Ropke, connected with Grainger & Co., Louisville, Ky., for the past 17 years, has been elected vice-president and general manager, succeeding the late W. C. Brohm. James T. Slade and Edward D. Cross have been elected to the directorate of the company. The company has a record of 83 years' continuous operations, with the exception of five days' idleness during the Civil War.

E. J. Buffington, president Illinois Steel Co., was re-elected president of the Indiana Steel Co. and the Gary Land Co., June 13, at meetings in Gary, Ind., of stockholders and directors of United States Steel Corporation subsidiaries. B. F. Affleck of Chicago was re-elected president of the Universal Portland Cement Co. L. W. McNamee was elected president of the Gary Land Co.

W. E. Mansfield has accepted the position of chief chemist and metallurgist with the Cayuga Tool Steel Co., Ltd., Auburn, N. Y. For the past five years he was chief chemist with the Page-Storms Drop Forge Co., Chicopee, Mass.

J. L. Haines, assistant to Vice-President Willis L. King of the Jones & Laughlin Steel Co., Pittsburgh, is in Manomet, Mass., on an extended vacation for the purpose of building up his health, which has been impaired for some time.

J. G. Butler, Jr., Youngstown, Ohio, has agreed to contribute $200,000 for the erection of a building in that city to contain an art museum. The proposed museum will be a private institution, in which Mr. Butler will house his own collection of valuable paintings. The proposed structure will have a frontage of 124 ft., a depth of 50 ft. and will be 32 ft. in height to the roof. The highest grade of Georgia marble will be used, while the exterior face of the stone will be sand rubbed. Work will be started in a short time and admission will be entirely free to the public.

Richard G. Williams, special investigator Norton Co., Worcester, Mass., has been made secretary of the executive committee of the Worcester section of the American Society of Mechanical Engineers and Victor E. Edwards, vice-president Morgan Construction Co.; Howard P. Fairfield, assistant professor of machine construction, Worcester Polytechnic Institute, and Frederick W. Parks, president and sales manager G. M. Parks Co., have been made members of the committee.

Lawrence V. Benet, vice-president Société Anonyme des Anciens Etablissements Hotchkiss & Co., Paris, France, is to represent in this country the American Chamber of Commerce in Paris, of which he is president, and André Tardieu, the French High Commissioner to the United States, is associated with him, armed with statistics of the requirements of France. Mr. Benet is a member of the American Society of Mechanical Engineers.

Charles D. Young, engineer of tests, Pennsylvania Railroad, Altoona, Pa., has been appointed a representative of the American Society of Mechanical Engineers on the engineering committee of the National Research Council.

The Howe Scale Company, Rutland, Vt., has removed its Philadelphia office from 508 Market Street to a new building at 806 Arch Street. The company has been at the Market Street address for about 20 years. C. T. Lamb is local manager.

The Wildman Mfg. Co., Astor and Elm Streets, Norristown, Pa., manufacturer of machinery and parts, has announced a voluntary advance of employees' wages at the rate of 5 cents an hour.

Munitions Tax "Evasion" a Matter of Bookkeeping

WASHINGTON, June 19.—Sensational reports published in the daily newspapers to-day to the effect that attempts have been made by munitions makers to evade the payment of the profits taxes imposed by the Act of September 8, 1916, appear to be based upon misunderstandings and disagreements between the accounting departments of a number of large concerns making war material and the Internal Revenue Bureau. No official can be found who will go so far as to say that frauds upon the revenue have been attempted, but treasury officials insist that the returns made do not represent the tax the Government is entitled to receive under the law and that the shortage is likely to exceed $10,000,000. This amount the manufacturers are now ready to pay under protest.

The tabulation of returns of the munitions tax, completed several weeks ago, proved disappointing to the revenue officials, the aggregate, $26,500,000, being considerably less than the estimate upon which the munitions tax of 1916 was based. Investigation resulted in the disclosure that several concerns had deducted from their gross profits large sums for the amortization of plants and equipment specially constructed for the filling of certain contracts which have expired or are about to expire, rendering these facilities valueless for any other purpose, according to the contentions of the manufacturers. The internal revenue officials, however, insist that these plants are still valuable for other purposes and are likely to be employed hereafter in filling similar contracts either for foreign governments or for the United States. Upon receipt of all the reports of the special agents now engaged in this investigation, a ruling adverse to the manufacturers has been made and the munitions makers have notified the department that they will pay the amounts found to be due. A test case may be brought in the courts to determine the validity of the Internal Revenue Bureau ruling.

W. L. C.

Greaves-Etchells Furnace Installations

New contracts for Greaves-Etchells electric steel furnaces are announced as follows:

Stewart & Lloyd, Ltd., Glasgow, Scotland, will install a 3-ton furnace.

Peugeot Freres, France, will install a 3-ton furnace.

T. H. Watson & Co., Ltd., of Sheffield, England, agents for the furnace, announce that the number now installed or under erection is over 30. The small furnace, making high speed steel for Spear & Jackson, Ltd., Sheffield, has made 1200 heats with the lining renewed only once. A larger furnace has made 200 heats of high speed steel.

Contract for Foundry Coke

PITTSBURGH, June 20.—(*By wire.*)—A contract for 30 cars per month of high grade foundry coke has been made for last half of the year delivery at $10 per net ton at oven.

French exports of iron ore and iron and steel were very small in 1916. Returns of the Board of Trade show that while iron-ore exports in 1914 were 4,828,592 tons, they were only 94,864 tons and 74,561 tons in 1915 and 1916 respectively. The iron and steel exports in the three years were 419,142 tons, 152,116 tons and 163,642 tons, respectively.

The Third National Exposition of Chemical Industries will be held in the Grand Central Palace, New York, Sept. 24 to 29, 1917. All the space on the two lower floors at the 1916 exposition has been taken again with some on the third floor.

Beals, McCarthy & Rogers will be the name of the iron, steel and hardware business of Beals & Co., Buffalo, after July 1. The partners are Pascal P. Beals, Eugene J. McCarthy and Charles P. Rogers.

OBITUARY

JAMES RUSSEL HOUSTON, auditor of Rogers Brown & Co., Cincinnati, died June 12 at Christ Hospital in that city, as a result of an operation, aged 42 years. He has been auditor of Rogers, Brown & Co. for the past 10 years and was previously connected with the Portsmouth Steel Co., Portsmouth, Ohio. He was well known in iron and steel circles in Cincinnati and also in the Hanging Rock iron district in Ohio.

SIDNEY W. WINSLOW, president of the United Shoe Machinery Corporation, died at his home in Beverly, Mass., June 18. Mr. Winslow was born in Brewster, Mass., in 1854 and was prominent in financial circles. He was also president of the United Fast Color Eyelet Company and of several other shoe machinery and appliance concerns.

JAMES PENDER, founder and managing director of James Pender & Co., Ltd., manufacturers of wire and wire nails, St. John, New Brunswick, Canada, died in that city May 30.

Italy's Reduced Buying of Iron and Coal

Referring to the recent action of the Italian Government in deciding to cut its consumption of coal and iron by one-half in its effort to meet the submarine menace, Enrico Arlotta, a member of the mission, said at Washington:

"The reduction was made possible by intensive development of Italy's water-power resources, and the elimination of the manufacturing of all those articles which required steam power to produce. The articles could be purchased in your country ready made, we found, and could be shipped to Italy at a cost considerably lower than it was possible for us to produce them.

"The submarine campaign cut down the available supply of tonnage to such a point that freight and insurance rates almost reached prohibitive figures. The Government conducted a minute examination and found that ocean tonnage had soared to such heights that by the time one ton of American coal was ready for consumption in an Italian factory, it reached the enormous cost of $70 in some cases. The same situation held true regarding iron."

The Supply of Platinum

The normal requirements of platinum in the United States call for 165,000 ounces each year, according to the U. S. Geological Survey. The quantity in chemical laboratories is probably not over 10 to 15 per cent of the supply and is all recoverable. About 4 per cent of the apparent stock in the United States in 1915 was used in contact-process sulphuric acid works. The dental industry formerly used 25 to 30 per cent of the supply but a number of alloys are now used instead of platinum. The jewerly industry has voluntarily agreed to limit the use of platinum during the war. The quantity of platinum in the United States is estimated at 1,000,000 ounces besides which there are over 400,000 ounces of other metals of the platinum group such as palladium, iridium and rhodium. The supply is apparently sufficient for immediate requirements.

Further figures on the effect of hours of work on output observed by the British health of munition workers committee indicate that in the case of 100 women turning fuse bodies the output per week, working 60 hr., was 7343 against 6820 when working 68 hr., or an increased output of nearly 8 per cent for the less number of hours per week. In the case of 27 men sizing fuse bodies 6969 were produced in 56 hr. of work per week against 6150 in 62 hr. work per week, or a net gain of over 13 per cent. In the case of 9 youths sizing base plugs the output per week of 61 hr. was 9440 and for a week of 68 hr. 6830, or a net gain of over 38 per cent.

Pittsburgh and Nearby Districts

The William Tod Co., Youngstown, Ohio, owned by the United Engineering & Foundry Co., Pittsburgh, is selling its shell-making equipment and hereafter will not make ammunitions of any kind. Before it was taken over by the United Engineering & Foundry Co., the William Tod Co. did a very large shell business for the Allies.

The Brier Hill Steel Co., Youngstown, which will build two new plate mills in that city, has placed a contract with the Morgan Engineering Co., Alliance, Ohio, for one 25-ton, one 50-ton and eight 15-ton electric cranes.

The Carnegie Steel Co., Pittsburgh, has purchased a 50-ton crane for its Duquesne Steel Works, Duquesne, Pa.

Reports that the Elliott-Blair Steel Co., New Castle, Pa., will build hot rolling mills are officially denied. The company will confine itself to the manufacture of cold rolled strip steel as before.

The Pittsburgh office of the Fuller Engineering Co., Allentown, Pa., has received a contract for the building of a pulverizing coal plant at the Central Works of the American Rolling Mill Co., Middletown, Ohio, to furnish pulverized coal for three 55-ton and one 40-ton open hearth furnaces. The plant will have a capacity of 200 tons of pulverized coal per day. The Fuller Engineering Co. also has a contract from the American Smelting Co., Meurer, N. J., for a 400-ton plant for pulverizing coal for copper refining furnaces, also a 200-ton plant for the Bethlehem Steel Co., South Bethlehem, Pa., for making pulverized coal for open hearth furnaces in No. 1 Works, a 200-ton plant for pulverized coal for open hearth furnaces in the plant of the American Steel & Wire Co., Cleveland, and has just completed the building of a 600-ton pulverizing coal plant for the American Steel & Wire Co., Donora, Pa.

The Bessemer Limestone Co., Youngstown, held its annual meeting last week, at which former officials and directors were re-elected. Officers of the company are John Tod, president; F. R. Kanengeiser, vice-president and general manager; John R. Rowland, treasurer, and G. G. Treat, secretary and assistant treasurer.

The Wire Drawing Machine Co., New Brighton, Pa., has been incorporated with a capital of $100,000. The incorporators are Albert H. Miller, New Brighton; Samuel A. McCullough, West Brighton; M. B. Houck, Pittsburgh.

The Pittsburgh Pipeage & Equipment Co. has bought a large plot of ground adjacent to its works in that city, which will be greatly enlarged.

The court at Pittsburgh last week refused a petition of certain stockholders for the appointment of a receiver for the Baird Machinery Co. of that city. The court stated it would be detrimental to the interests of the creditors of the company to appoint a receiver at this time, as it appeared the company was operating at a profit and was in good condition financially. The petition was dismissed at the cost of the appellants.

Owing to the abnormal demand for soft coal for manufacturing purposes, and the very high prices ruling, coal companies in the Pittsburgh district are buying coal lands freely, and many former abandoned coal properties are being re-opened, and the coal mined and sold at a profit. The Carnegie Coal Co. purchased recently 2500 acres of coal lands in Washington County, Pa., and the Pittsburgh Coal Co. has recently bought 900 acres of coal lands in Washington County, Pa.

Stockholders of the Westinghouse Electric & Mfg. Co., East Pittsburgh, have re-elected retiring directors, J. D. Callery, Paul D. Cravath, Harrison Nesbit and James N. Wallace. The Westinghouse Machine Co. also re-elected its retiring directors, Guy E. Tripp, H. H. Westinghouse, J. D. Callery, E. M. Herr, H. T. Herr, William McConway, John R. McCune, Joseph W. Marsh and L. A. Osborne. Stockholders of both companies named above have approved plans for the merger of the Westinghouse Machine Co. with the Westinghouse Electric & Mfg. Co., and final details are now being worked out and will be completed in a short while.

The strike in the puddling plant of the A. M. Byers Co., Girard, Ohio, has been settled, and the men are back at work. The Amalgamated Association tried to form a lodge among the employees at this plant, but without success. The company posted a notice at its mills at Girard to the effect that on June 15 all of its employees of date of June 1 could return to their former positions without discrimination within one week, the company not objecting to any of its employees joining labor organizations, if they so desired. The plant will be operated in the future as it has in the past, and the company is ready and willing to take up any questions affecting the conditions of employment with a committee composed of its own employees. In other words, the position of the company is the same as it was before the strike took place. It did not sign any wage scales, and will continue to operate as an open plant. This company is paying the present Amalgamated scale of $11.80 per gross ton for boiling, but in times past has paid considerably higher than the existing Amalgamated scale rates. The company operates 88 puddling furnaces at Girard, the largest single puddling plant in this country. The entire output is used in making iron skelp, which in turn goes into Byers pure wrought iron pipe.

J. M. McGuire & Co., Westinghouse Building, Pittsburgh, has accepted the agency, east of the Mississippi River, for the products of the Union Chrome Co. of California, these including chrome ore, manganese ore and magnesite. The firm handles coal, coke, limestone, open hearth materials, etc.

New Installations of Heroult Furnaces

Licenses for the installation of the following Heroult electric steel furnaces have been issued by the United States Steel Corporation:

The Vanadium Alloys Steel Co., Latrobe, Pa., one 3-ton furnace for making special steel. It has been operating a 3-ton furnace of this type for some time.

The Bayonne Steel Casting Co., Bayonne, N. J., one 3-ton furnace for making steel castings. It is at present making castings by the converter process.

The Taylor-Wharton Iron & Steel Co., High Bridge, N. J., one 3-ton furnace for making steel castings, supplementing its present converter process.

The Warman Steel Casting Co., Los Angeles, Cal., one 3-ton furnace for making steel castings.

The Crucible Steel Co. of America, one 6-ton furnace at its Atha plant at Harrison, N. J. This will be in addition to two 6-ton and one 3-ton furnaces.

These five furnaces will bring the total operating or contracted for in the United States and Canada to 125.

Midvale Company Ferromanganese

The Midvale Steel & Ordnance Co. has purchased 30,000 tons of manganese ore and will produce its own ferromanganese for consumption at its various steel plants. The company has entered into a conversion deal with the Wharton Steel Co. by which the latter will make ferromanganese from this ore in its No. 1 furnace at Wharton, N. J., production to begin in the immediate future. It is estimated this ore will produce 10,000 to 12,000 tons of ferromanganese in the year in which the arrangement will be effective.

It is the intention of the Buffalo Union Furnace Company, which recently leased the blast furnace of the Burden Iron Company at Troy, N. Y., to operate it on foundry iron. The furnace will be under the direct management of the Buffalo Union Furnace Company, in charge of B. Marron, general manager. D. J. Higgins will be local superintendent. C. R. Baird, New York, will be connected with the enterprise as an executive.

An anti-injunction bill passed by the California legislature has been vetoed by Gov. William D. Stephens.

IRON AND STEEL COMMITTEES

Full List of Appointees of Council of National Defense

WASHINGTON, June 19.—The Council of National Defense has prepared a revised list of the Co-operative Committee on Steel and Steel Products and the ten subcommittees appointed to serve thereunder. The list is as follows:

Co-operative Committee on Steel and Steel Products

Elbert H. Gary, chairman United States Steel Corporation, New York, chairman; James A. Farrell, president United States Steel Corporation, New York, vice-chairman; James A. Burden, president Burden Iron Co., Troy, N. Y.; Alva C. Dinkey, vice-president Midvale Steel & Ordnance Co., Philadelphia; Willis L. King, vice-president Jones & Laughlin Steel Co., Pittsburgh; Charles M. Schwab, chairman Bethlehem Steel Co., New York; John A. Topping, chairman Republic & Co., Cleveland; E. G. Grace, president Bethlehem Steel Corporation, New York; E. A. S. Clarke, president Lackawanna Steel Co., New York, secretary; H. H. Cook, American Iron and Steel Institute, New York, assistant secretary.

Subcommittee on Alloys

James A. Farrell, president United States Steel Corporation, New York, chairman; E. A. S. Clarke, president Lackawanna Steel Co., New York; E. G. Grace, president Bethlehem Steel Co., South Bethlehem, Pa.; E. J. Lavino, E. J. Lavino Co., Philadelphia; A. A. Fowler, Rogers, Brown & Co., New York, secretary.

Subcommittee on Sheet Steel

W. S. Horner, president National Association of Sheet and Tin Plate Manufacturers, Pittsburgh, chairman; Walter C. Carroll, American Sheet & Tin Plate Co., Pittsburgh; Charles Hadley, Alan Wood Iron & Steel Co., Philadelphia.

Subcommittee on Pig Tin

John Hughes, assistant to president United States Steel Corporation, New York, chairman; E. R. Crawford, president McKeesport Tin Plate Co., McKeesport, Pa.; Edwin Groves, president New York Metal Exchange, New York.

Subcommittee on Steel Distribution

James A. Farrell, president United States Steel Corporation, New York, chairman; E. A. S. Clarke, president Lackawanna Steel Co., New York; John A. Topping, president Republic Iron & Steel Co., New York.

Subcommittee on Scrap Iron

Eli Joseph, Joseph Joseph & Bros., New York, chairman; Samuel Deutsch, Ohio Iron & Metal Co., Chicago; Vernon Phillips, Perry, Buxton, Doane & Co., Philadelphia; Joseph Michaels, Hyman-Michaels Co., Chicago.

Subcommittee on Pig Iron, Iron Ore and Lake Transportation

H. G. Dalton, Pickands, Mather & Co., Cleveland, chairman; F. Billings, Tod-Stambaugh Co., Cleveland; H. Coulby, Pittsburgh Steamship Co., Cleveland; C. T. Dyer, W. P. Snyder & Co., Pittsburgh; Leonard Peckitt, president Empire Steel & Iron Co., Catasauqua, Pa.; F. B. Richards, M. A. Hanna & Co., Cleveland; W. T. Shepard, Rogers, Brown & Co., Buffalo; A. H. Woodward, Woodward Iron Co., Birmingham, Ala.; Amasa S. Mather, Pickands, Mather & Co., Cleveland, secretary.

Subcommittee on Tubular Products

James A. Campbell, president Youngstown Sheet & Tube Co., Youngstown, Ohio, chairman; Anson Mark, Mark Mfg. Co., Chicago; George Matheson, Jr., vice-president Spang, Chalfant & Co., Pittsburgh; W. H. Rowe, president Pittsburgh Steel Co., Pittsburgh; Edward Worcester, vice-president National Tube Co., Pittsburgh.

Subcommittee on Tin Plate

J. I. Andrews, general manager sales American Sheet & Tin Plate Co., chairman; E. R. Crawford, president McKeesport Tin Plate Co., McKeesport, Pa.; E. T. Weir, president Phillips Sheet & Tin Plate Co., Weirton, W. Va.

Subcommittee on Wire Rope

Carl G. Roebling, chairman, general manager of sales, John Roebling Sons' Co., Trenton, N. J.; Frank Baackes, vice-president and general sales agent, American Steel & Wire Co., Chicago; John J. Broderick, Broderick & Bascom Rope Co., St. Louis.

Subcommittee on Wire Products

Frank Baackes, chairman, vice-president and general sales agent American Steel & Wire Co., Chicago; George A. Mason, manager of sales Jones & Laughlin Steel Co., Pittsburgh; John C. Neale, vice-president and general manager of sales Midvale Steel & Ordnance Co., Philadelphia; J. E. Frederick, secretary Kokomo Steel & Wire Co., Kokomo, Ind.; H. Sanborn Smith, vice-president and general manager of sales, Gulf States Steel Co., Birmingham, Ala.

The Excess Profits Tax

WASHINGTON, June 19.—As the result of the President's insistence that Congress shall consider food and fuel control legislation to the exclusion of all other subjects in the hope of enacting the so-called Lever bill by July 1, the Senate Finance Committee has postponed its report upon the war revenue bill and will probably hold that measure in committee for another fortnight.

The Finance Committee is having great difficulty in securing an agreement as to the tax on excess profits. The decision to adopt the English basis in lieu of that of the existing law for the calculation of war profits was followed by an investigation to determine the practical effect of the change, but up to the present time the data secured have not been sufficiently conclusive to satisfy the committee. The Internal Revenue Bureau has the returns for the calendar year 1916, based on a levy of 8 per cent of all profits in excess of 8 per cent plus $5,000. The committee desires to exceed this amount in the new law, which will be based on the difference between current profits and the average of those of any two of the three years prior to July 1, 1914, but, in default of information as to the aggregate of the profits made before the war by corporations subject to this levy, it is impossible to fix the new rate of tax. The judgment of the committee is now wavering between 16 and 20 per cent, with a few members in favor of a rate as high as 25 per cent.

Shipbuilding Expansion at Newport News

The Newport News Shipbuilding & Drydock Co., Newport News, Va., with office in the Woolworth Building, New York, is spending about $4,000,000 in new buildings and equipment for its shipyard, which is engaged in building ships for the United States Navy. The company has closed recently with the McClintic-Marshall Co. for 7000 tons of fabricating steel for shipways and for crane runways for these shipways. A contract has also been closed with the McClintic-Marshall Co. for the construction of an erecting ship, 80 x 560 ft., in which 1000 tons of steel will be used. A foundry extension will also be built, for which a 6-ton electric furnace has been purchased from the United States Steel Corporation. A sand blast room has been equipped by the American Foundry Equipment Co. Cranes will be purchased aggregating about $500,000 in value and new machine-tool equipment will cost approximately $700,000 or $800 000. All electrical equipment is being supplied by the General Electric Co.

West End Blast Furnace Sold

The blast furnace formerly operated by the West End Furnace Co., in Roanoke, Va., was sold sometime ago to John W. Hubbard, of the Hubbard interests at Pittsburgh, who has turned it over to the Old Dominion Pig Iron Corporation, recently organized, which will operate it. Since Mr. Hubbard bought the furnace, the equipment has been put in first class shape, and extensions made to the cast house, blowing capacity, boilers, and in fact the furnace has been completely overhauled. It was put in blast on Monday, June 18, and will turn out about 200 tons of foundry iron per day.

Locomotive Orders

Orders for 19 locomotives have been placed in the past week. The American Locomotive Co. will build 6 mountain type for the Rhodesian Railway and 9 locomotives of various types for the Sorocobana Railroad. The Alan Wood Iron & Steel Co. has ordered 3 locomotives from the Baldwin Locomotive Works. Up to and including June 16, there were 127 locomotives ordered, bringing the total for the year to that date to 3080 of which 1185 are for foreign countries.

The Chattanooga Gas & Coal Products Co., Chattanooga, Tenn., has awarded a contract to the Semet-Solvay Co., Solvay, N. Y., for the erection of a series of new byproduct coke ovens to have a capacity of about 10,000 tons of coke monthly. Construction will be commenced at once.

Machinery Markets and News of the Works

SHIPYARDS ACTIVE BUYERS

Big Business Waiting on the Government

Expansion of Tractor Industry Stimulates Tool Sales—Air Fleet Program Interests Motor Makers—Munitions Orders Causing Plant Expansion

Government work is occupying the attention of the machinery and machine-tool trade to the exclusion of almost all other business. The placing of large orders for munitions and activities in shipbuilding will soon stimulate the market. A few of the large machine-tool plants are now very busy on Government work, and have virtually withdrawn from the market. Others are holding themselves in readiness to meet the Government requirements. Delays at Washington in making shipbuilding plans known create a feeling of uncertainty. As soon as contracts for steel ships have been let, a flood of inquiries which has been received by the trade during the past few weeks will doubtless quickly materialize in orders for machine tools and other equipment for shipbuilding plants.

Aside from the passage of the War Budget bill, which authorizes the Government to take over all shipbuilding, the most important development of the week which will have an effect on machine-tool trade is the announcement of tentative plans for an immense air fleet to cost possibly $600,000,000, which is good news to the automobile factories of Detroit and elsewhere which will be called upon to furnish about 100,000 airplane motors. Another factor which will better the market is the proposed manufacture of tractors on an unprecedented scale.

The price situation is not only a disturbing factor to the buyers of machine tools, but it is also disconcerting to the builders who are quite generally selling on a "price at time of delivery" basis because of uncertainty as to the future course of the pig iron market.

Government work will doubtless delay deliveries and some concerns will only accept contracts with the understanding that delays due to interference of Government work shall not be a cause for cancellation.

The Newport News Shipbuilding & Drydock Co. has issued a list of its machinery requirements. There are also several large inquiries in the market for cranes. Several New England plants are expanding on account of large munitions and equipment orders and there is increased activity in the motor truck and farm machinery industries.

New York

NEW YORK, June 20.

The authorization, included in the War Budget bill, signed by President Wilson last week, to take over control of all shipbuilding plants, will probably help to clear up the puzzling situation which has been existing in the machinery trade for the past few weeks. Machinery builders, holding themselves and their plants in readiness to meet the Government requirements, whatever they might be, have been disconcerted because of the interminable delays by the Government in making known its needs. Meanwhile private business to a considerable extent has been held back, manufacturers evidently preferring to withhold their orders until it could be definitely determined to just what extent the Government orders would delay deliveries.

A flood of inquiries which has been received by the machine-tool trade during the past few weeks will doubtless soon materialize in orders, now that the uncertainty as to Government shipbuilding plans is to an extent, at least, removed.

Several of the large machine-tool plants are now busy on Government work, while others have filed with the Ordnance Bureau at Washington a list of the machine tools they can deliver within reasonable periods. Deliveries for Government work are, of course, being given the preference, and as a great many manufacturers are now or soon will be engaged in manufacturing which in one way or another is important to the conduct of the war, some controversies are likely to arise which the machinery builders, themselves, would find it embarrassing to adjudicate. To solve these very problems a Priority Board has been appointed under the supervision of the Council of National Defense, and this board will settle differences whenever and wherever they occur relating to deliveries of machinery and other products. Where a machine tool is required for work being done for the Government, the order is now very often accompanied by a letter from the Ordnance Bureau stating that prompt delivery is essential to the success of the war program, and asking the builder to facilitate delivery as much as possible.

A few large concerns are virtually out of the market on machine tools. The Government business, with what they already had on hand, has filled up their capacity for many months to come.

Business during the past week has consisted mainly in the sale of a tool here and there. It is known that in at least one instance a prospective large purchase of machine tools has been withdrawn owing to the existing high prices and difficulty in getting promises of satisfactory delivery.

The Newport News Shipbuilding & Drydock Co., Newport News, Va., with New York office in the Woolworth Building, issued a list this week for cranes and machine tools so that work on ships for the United States Navy may be speeded up. This list is as follows:

Four 60-in. double-end plate punches.
Three horizontal punches.
Two double-end beam punches.
One double-angle shear.
One angle planing and beveling machine.
Two 30-ft. plate planers.
One 2-arm traversing radial drill.
One horizontal straightening roll.
Ten wall radial drills.

A separate list on cranes contains the following requirements:

Nine 7½-ton traveling bridge cranes.
Two 20-ton traveling bridge cranes.
Two 7½-ton gantry cranes.
One 3-ton gantry crane.

The Newport News Shipbuilding & Drydock Co. closed during the past week with Heyl & Patterson of Pittsburgh for eight 15-ton and one 75-ton electric traveling cranes and for one 20-ton crane with the Pawling & Harnischfeger Co., Milwaukee, and with the Shaw Electric Crane Co. for a 200-ton crane. This company is about to close this week for four 16-in. engine lathes, six 20-in. engine lathes, two 24-in. engine lathes, two horizontal boring mills, one 48-in. radial drill, one 24-in. gap lathe and two turret lathes.

The price situation is chaotic. On some tools, for which demand is not extraordinarily large under the circumstances, the advances are in line with the present higher costs of raw material, while on other machines, for which there is a great demand and a limited supply, prices are largely determined by what buyers are willing to pay. A somewhat extreme case is that of a recent sale at $5,000 of a machine which in normal times sold at $1,800. Boring mills are very scarce and there is a good inquiry for second-hand machines to fill immediate requirements.

Prices, high as they are, are not quite so serious a problem to the average purchaser as the question of deliveries. One maker of boring mills will not promise delivery short of 1919. Deliveries on all types of machines may be reckoned at from two to three times the period required in normal times. Some makers are inserting a clause in their contracts that cancellation is not permissible in the event that interference of Government work delays delivery beyond the date specified. Prices are being quoted in most instances subject to immediate withdrawal, if not accepted, and the "price prevailing at time of delivery" is becoming a more favorite way of quoting. A few makers announce that existing prices will hold only until July 1.

The making of steel plates for ships will require large numbers of punching and shearing machines, for which there is a steady inquiry, and large lathes for engine building are also sought.

The crane business is exceedingly active. In addition to the requirements of the Newport News Shipbuilding & Drydock Co. mentioned above, there are numerous other inquiries in the market, one of the largest being from the American Smelting & Refining Co., which is asking bids on fourteen rigid arm cranes of various capacities, and on twelve traveling cranes, mostly of 10-ton capacity. The Maryland Shipbuilding Co., Baltimore, is inquiring for six 5-ton cranes, and the Baltimore Drydock & Shipbuilding Co., Baltimore, is expected to close this week for about fifteen cranes. One concern is offering to make deliveries in four months, but the majority of crane builders require six months or longer.

Demand from foreign countries for machine tools is strong and in a few instances machine-tool builders have declined foreign business owing to the extreme difficulty of supplying the domestic trade. India, Chile, Spain, France, England and Russia are all in the market for tools. An inquiry from Russia for tools used in munitions making would seem to indicate that preparations are being made in that country to carry on the war more vigorously. A large number of machine tools consigned to Sweden remain in cars or on the docks here because of difficulties in obtaining permits from England for their safe passage.

The Tata Iron & Steel Co., Ltd., Sakchi, India, through Charles Page Perin and S. M. Marshall, engineers, 2 Rector Street, has been placing orders in considerable quantity for machine tools and for a complete bolt and nut shop equipment. It has also issued preliminary inquiries for a complete fabricating shop equipment, including a variety of punching and shearing machines, riveters, wall radials, etc.

The Celluloid Co., 290 Ferry Street, Newark, N. J., will erect a one-story addition to its plant, about 30 x 70 ft., at 51 Westcott Street.

C. A. Goldsmith, 142 Cutler Street, Newark, N. J., has filed plans for rebuilding his foundry, partially destroyed by fire recently. The plant specializes in the production of brass and bronze castings.

Moore & Ward, 123 Washington Street, Newark, N. J., have been incorporated with a capital of $25,000 to manufacture automobile tires, etc. George S. Moore, Harcourt S. Ward, and Robert N. Shoemaker are the incorporators.

The Liberty Tool Co., Newark, N. J., has been incorporated with a capital of $25,000 to manufacture tools and machinery. Stephen Schaffer, Albert Sarossy and M. J. Reilly, all of Newark, are the incorporators.

Schaefer & Beyer, Newark, N. J., have been organized to operate a plant at 32 Bragaw Avenue for the manufacture of gasoline torches, etc. Fred J. Schaefer is head of the company.

The Crucible Steel Co. of America, Harrison, N. J., is having plans prepared for a new one-story forge shop, about 200 x 400 ft., to be erected on South Fourth Street.

The Delaware, Lackawanna & Western Railroad, Hoboken, N. J., has filed plans for the erection of a new engine terminal and repair plant at Sixteenth and Henderson streets, Jersey City, to consist of a five-stall engine house, to cost about $25,000; repair shop, boiler house and general service building. The entire plant is estimated to cost $50,000. The R. D. Richardson Construction Co., Scranton, Pa., has the contract.

The Air Reduction Co., Jersey City, N. J., manufacturer of oxygen, will build a two-story brick plant at 134 Halladay Street.

The Detroit Steel Products Co., 30 East Forty-second Street, New York, and Detroit, has been incorporated in New Jersey with capital of $1,250,000, and local office at Jersey City, to manufacture iron and steel specialties. John G. Rumney is president, and Harold F. Wardell, secretary.

The Swenson Shipbuilding Co., Jersey City, N. J., has been incorporated with a capital of $500,000 to operate a shipbuilding plant. O. Frederick Swenson, Howard T. Alexander and Godfrey N. Nelson are the incorporators.

The Paterson Piano Case Co., Paterson, N. J., has been incorporated with a capital of $150,000. Joseph T. Brooks, Julius Winton and William Heller, Paterson, are the incorporators.

The New Jersey Shipbuilding Co., Gloucester City, N. J., has awarded a contract to George Pawling & Co., Camden, N. J., for the construction of its proposed new shipbuilding plant at a cost of about $1,000,000 and will include brick and steel shop buildings, shipbuilding berths, runways, etc. It is said that the works will have an initial capacity of 10 vessels of 4000 tons and over. The company is affiliated with the Pennsylvania Shipbuilding Co., Land Title Building, Philadelphia.

The Stamping Products Corporation, New York, has been incorporated with a capital of $25,000 to manufacture metal molds, etc. S. B. Sherman, C. A. Anderson and G. C. Steeves, 630 West 141st Street, are the incorporators.

The Premier Metal Etching Co., 625 East Eighteenth Street, New York, will build a new two-story, reinforced-concrete plant, about 75 x 100 ft., on Van Alst Avenue, Long Island City, to cost $70,000. P. H. Bosse is president.

The Staten Island Shipbuilding Co., 1 Broadway, New York, has filed plans for the erection of two additions to its plant at Port Richmond, Staten Island, consisting of a shop building to cost $42,000 and a one-story foundry to cost $25,000.

The Kerr Steamship Co., Great Kills, Staten Island, has been incorporated in Delaware with a capital of $1,500,000 to construct a local shipbuilding plant. The incorporators are P. L. Woodward, Great Kills; Joseph P. Shelby, Edgemere, L. I.; and Robert E. Maloney, Brooklyn, N. Y.

The New York Rubber Co., 84 Reade Street, New York, has increased its capital from $300,000 to $500,000.

B. Brettler, New York, operating a metal working plant at 227 East Forty-seventh Street, has incorporated the Brettler Sheet Metal Works with a capital of $10,000 to specialize in the manufacture of iron floor plates. B. and M. Brettler head the company.

The Nassau Smelting & Refining Works, 603 West Twenty-ninth Street, New York, manufacturer of babbitt metal, brass and foundry supplies, has been incorporated with a capital of $1,000,000. I. H. Livingston is one of the incorporators.

The Merchant Shipbuilding Corporation, New York, has been incorporated in Delaware with a capital of $20,000,000 to construct a shipbuilding plant. Hugh R. Partridge and Arthur P. McKinstry, New York, and William D. Hart, Glenbrook, Conn., are the incorporators.

The T. H. Symington Co., Crescent Street, Lincoln Park, Rochester, N. Y., manufacturer of railway equipment, forgings, etc., will build a one-story addition, 85 x 375 ft., at Atlantic Avenue and Crouch Street, to cost $50,000.

The Peth Pressing Process Co., Rochester, has recently been incorporated with a capital of $50,000 to manufacture pressing irons and cutting machinery. H. W. and B. V. Peth, Rochester, are the principal incorporators.

The United Shoe Machinery Co., Boston, is planning for the operation of its branch factory at Binghamton, N. Y., about Aug. 1. Machinery and equipment is now being installed.

The Permalife Storage Battery Co., Poughkeepsie, N. Y., has been incorporated with a capital of $1,000,000 to manufacture storage batteries, etc. E. P. Sheehy and E. T. Coffin, Poughkeepsie, are the incorporators.

The Sanford Motor Truck Co., St. Marks Avenue and West Fayette Street, Syracuse, N. Y., manufacturer of automobile trucks, has been reorganized to increase the capacity of its works and for general expansion. It will specialize in the production of 1 and 2-ton internal gear drive trucks, and 2½ and 5-ton worm drive trucks. J. F. Durston is president; E. A. Kingsbury is treasurer and general manager.

The Stanley Vehicle Spring Co., Syracuse, has been incorporated with a capital of $100,000 to manufacture springs. W. H. Robinson, F. W. Green and H. P. Denison are the incorporators.

The Watson-Stillman Co. has completed an erecting shop, 60 x 130 ft., 40 ft. high, at its plant at Aldene, N. J. No new machinery will be required.

The American Warming & Ventilating Co., Elmira, N. Y., is building a two-story addition, 50 x 80 ft., to its plant on Falck Street.

Jamestown, N. Y., is receiving bids for a pump and equipment for its waterworks system. L. P. Hopgood is su-

perintendent of waterworks and C. C. Hopkins, 349 Cutler Building, Rochester, is the engineer.

The Kellogg Structural Steel Co., Buffalo, has had plans drawn for a one-story addition, 55 x 150 ft., to its fabricating shop at Stone Street and the New York Central Railroad.

New England

BOSTON, June 18.

Greater activity is reported in the machinery market and this without any notably large lists being issued. The demand for universal milling machines, universal grinding machines, boring mills, planers and large lathes, radials and sensitive drills continues unabated. Recently there has been a heavy demand for presses from concerns that are receiving substantial orders for widely varied kinds of war equipment. One company which has been in the market for presses is to make 250,000 hospital cots; another is to make gas masks and heel plates. Along with the demand for presses comes good orders from diemakers for vertical milling machines and shapers. As war orders of this kind are increasing, it is expected that an increasingly vigorous demand will spring up from the manufacturers of the essential machinery, tools, gages and dies.

Reports of large munitions orders are becoming a daily feature. John E. Otterson, vice-president of the Winchester Repeating Arms Co., will distribute cartridge orders for the Government that will aggregate about $100,000,000 and the Winchester plant will add 10,000 hands to fill its share of Government orders. The Simonds Mfg. Co., Fitchburg, Mass., has taken a $17,000,000 order for steel helmets. The Colt's Patent Fire Arms Co., Hartford, Conn., will make 500,000 automatic pistols, a contract involving $7,750,000, and is rushing a big addition to take care of this work. The Bridgeport Projectile Co. has received an order for 500 3-in. guns and will increase its capacity by an addition, 90 x 200 ft., one story. An unverified report credits the American & British Mfg. Co., Bridgeport, Conn., with a similar order. One Boston manufacturer that has been particularly successful in its work for the Allies is reported to have received a $5,000,000 order for gun mounts. It is commonly known that 15 or 20 New England factories are being studied to determine their availability for the manufacture of anti-aircraft gun mounts and that orders may be forthcoming at any time. The Gray & Davis Co., Cambridge, Mass., has received an order for 1,000,000 detonators and this with a previous order for 250,000 will keep it busy for nearly a year with present equipment.

The Magnus Co., New Haven, Conn., contemplates the erection of a foundry on Eddy Street this summer, as its foundry at 256 Cedar Street is too small to meet the present demand for castings.

The New England Drawn Steel Co., Mansfield, Mass., has begun operations in its new plant, although all the equipment is not yet installed.

The Sessions Clock Co., Forestville, Conn., has awarded contracts for three factory buildings: a plating shop, 40 x 160 ft., one story; an addition to the movement shop, 50 x 120 ft., four stories, and an addition to the case shop, 50 x 120 ft., three stories.

The Gasorator Co., Bridgeport, Conn., has been incorporated with authorized capital stock of $10,000 to manufacture motor parts. The incorporators are Jesse G. Hawley, Claude A. Herman and Charles R. Dosch.

The Bullard Machine Tool Co., Bridgeport, Conn., has awarded contracts for a machine shop, 100 x 200 ft., one story, and a pattern shop, 60 x 142 ft., one story, both to be located at its foundry in Fairfield.

The W. A. Ives Mfg. Co., Wallingford, Conn., has increased its capital stock from $50,000 to $100,000.

The Heppenstall Forge Co., Bridgeport, Conn., will erect an office building, 36 x 65 ft., two stories.

The Scovill Mfg. Co., Waterbury, Conn., has begun work on a building, 125 x 264 ft., one story.

The McWilliams Mfg. Co., Providence, R. I., machinery, has been incorporated with capital stock of $30,000 by Harriet B. McWilliams, Thomas F. Tierney and George W. Bugbee.

The Spencer Screw Co., Springfield, Mass., has been incorporated with authorized capital stock of $10,000. The directors are A. M. Spencer, president; George C. Robert, Holyoke, treasurer, and J. B. Beauvais.

The Connecticut Engineering & Metal Products Co., Greenwich, Conn., has been incorporated with authorized capital stock of $10,000 to manufacture metal specialties and electrical goods. The incorporators are Raymond M. Boden, Waterbury; Ambrose M. Boles, Greenwich, and Charles C. Schoen, New York.

The White-Greenman Arms Co., Boston, has been incorporated with authorized capital stock of $500,000. The directors are John B. Crapo, president; Charles E. Greenman, 48 Park Street, Haverhill, treasurer, and J. J. Green.

The Liberty Arms Corporation, Boston, has been incorporated with authorized capital stock of $50,000. Charles A. Williams is president and Joseph S. Donovan treasurer.

The Tuck Mfg. Co., Brockton, Mass., has been incorporated with capital stock of $20,000 to manufacture tools, springs and hardware specialties. The directors are Lon Weston, president; Lawrence G. Weston, treasurer, and M. G. Weston.

The H. C. Freeman Co., Boston, has been incorporated with authorized capital stock of $50,000 to manufacture hoisting machinery, cars, track, etc. Henry C. Freeman is president and Louise S. Freeman, 141 Milk Street, treasurer.

The H. G. Butt Mfg. Co., Boston, has been incorporated with authorized capital stock of $10,000 to make machinery specialties and metal and wood patterns. Herbert G. Butt is president.

The McKean Turbine Co., Boston, has been incorporated with authorized capital stock of $10,000. The directors are Hallett Nowell, president; Edward G. Ludlam, 17 Lee Road, Newton, treasurer, and E. A. McKean.

The Saco Lowell Shops, Lowell, Mass., have awarded contracts for three additions: 70 x 182 ft., five stories; 60 x 62 ft., five stories; 60 x 116 ft., one story.

Philadelphia

PHILADELPHIA, June 18.

The Bureau of Yards and Docks, Washington, D. C., has awarded a contract to Warren, Moore & Co., Commercial Trust Building, Philadelphia, for the erection of a one-story brick and steel foundry, about 80 x 650 ft., at the League Island Navy Yard, Philadelphia. A contract has also been awarded to the M. J. Roche Construction Co., Johnson Building, Cincinnati, for a one-story brick and reinforced-concrete power house, 100 x 260 ft., at the League Island yard.

John Berkelbach, Philadelphia, will build a one-story machine shop at 3537-39 Ninth Street, to cost about $8,000.

The Marine Brass Co., Philadelphia, has been incorporated with a capital of $10,000 to operate a foundry for the production of brass castings for marine service. J. S. Fulton is treasurer.

The Textile Utilities Corporation, Philadelphia, has been incorporated with a capital of $700,000 to manufacture textile machinery. George H. B. Martin, Philadelphia, and S. C. Seymour, Camden, N. J., are the incorporators.

The Penn Chemical Works, 1332 Washington Avenue, Philadelphia, has awarded contracts for the erection of a three-story addition about 25 x 50 ft. and a one-story power house, about 40 x 100 ft., to cost $75,000. Nickron Duggan & Co., Philadelphia, are the contractors.

The Pennsylvania Railroad, Philadelphia, has awarded a contract for the erection of a one-story shop building, about 100 x 170 ft., at its Girard Point plant to Brann & Stuart, Commercial Trust Building, Philadelphia.

The Motor Equipment Co., Philadelphia, has been incorporated with a capital of $20,000 to manufacture motor specialties. Charles M. Green is the principal incorporator.

The DeFrain Sand Co., Philadelphia, will build a one-story machine shop at Beach and Berks streets.

The Rinehart-Droxler Wagon & Auto Body Builders, Inc., Philadelphia, has been incorporated in Delaware with a capital of $25,000 to build automobile and wagon bodies. George H. Rinehart, Edward M. Droxler and Charles M. Hogarth, Philadelphia, are the incorporators.

The American Briquette Co., Philadelphia, a Delaware corporation, has increased its capital from $25,000 to $200,000 for enlarging its facilities.

The proposed new addition to the plant of the Victor Talking Machine Co., Camden, N. J., will be one-story, reinforced-concrete and steel, about 28 x 154 ft., and will be an addition to cabinet works building No. 17.

The South Jersey Shipbuilding Co., Camden, N. J., has been incorporated with a capital of $125,000 to erect a plant at Leesburg, on the Maurice River. It is said that the

proposed works will be devoted to the construction of a special type of vessel for coast service. Howard Compton, Leesburg; Albert D. Cummins, 207 Westmont Avenue, Haddonfield, and Walter R. Sparks, 1867 Wynnwood Road, Philadelphia, are the incorporators.

The Delion Tire & Rubber Co., Trenton, N. J., has been incorporated in Delaware with a capital of $3,500,000 to manufacture rubber and rubber products. The company is operating a plant on East State Street, and has recently awarded contracts for the erection of two reinforced-concrete additions, about 50 x 112 ft. and 25 x 65 ft., to cost about $20,000.

The Imperial Porcelain Co., Mulberry Street, Trenton, N. J., has broken ground for the erection of its new plant at Neptune City, Manasquan. The initial works will consist of two one-story buildings, about 130 x 250 ft., and 60 x 150 ft. The plant is estimated to cost $75,000 and will be used for the manufacture of porcelain specialties for electrical service. F. A. Duggan and B. B. Dinsmore head the company.

The John A. Roeblings' Sons Co., Trenton, N. J., manufacturer of wire and wire rope, will erect a one-story brick addition at Hancock and Tremont streets.

The new organization which recently acquired the Chester Shipbuilding Co., Chester, Pa., is reported to have secured extensive property fronting on the Delaware River at Bristol, for the establishment of a new shipbuilding plant. The proposed works will be affiliated with the Chester Company, and of which Carl W. Hamilton, 50 Broad Street, New York, has been elected president. C. P. M. Jack, Swarthmore, is general manager.

The Seaboard Steel Casting Co., Delaware Avenue, Chester, Pa., is reported to be planning for the erection of a new foundry to double the present capacity. A new pattern shop and power house, as well as gas retorts will also be erected. This company was recently acquired by the American Locomotive Co. S. Everett Sproul is manager.

The National Casting Co., Carlisle, Pa., has been incorporated with a capital of $50,000 to operate the former plant of the Marietta Mfg. Co., Marietta, Pa., recently acquired. The plant is being remodeled and improved, and will soon be placed in operation for the production of iron and steel castings. J. H. Foreman and W. R. Sohn, Harrisburg, and A. G. Bashoar, Millersburg, are the incorporators.

The Cornwall Railroad Co., Lebanon, Pa., is building an addition to its machine shops at West Lebanon.

The Fleetwood Metal Body Co., Fleetwood, Pa., is planning for the immediate rebuilding of its plant, recently destroyed by fire. It specializes in the manufacture of automobile parts and bodies.

The Wire Drawing Machine Co., New Brighton, Pa., has been incorporated with a capital of $100,000 to manufacture machinery. Albert H. Miller, Samuel A. McCullough, New Brighton, and M. B. Houck, Pittsburgh, are the incorporators.

The Silvex Co., South Bethlehem, Pa., has acquired a tract of about 10 acres at Northampton Heights for the erection of a new plant. It has awarded a contract to the Austin Co., Cleveland, for the construction of two brick, steel and reinforced-concrete buildings, one and two-stories, about 60 x 180 ft., and 60 x 300 ft., to comprise the initial units. The new plant is estimated to cost about $1,000,000 and it is said will be used for the manufacture of spark plugs. E. H. Schwab is president.

The Brinton Motor Truck Co., Downington, Pa., has been incorporated with a capital of $20,000 to manufacture motor trucks. W. G. Edge is treasurer.

The Allentown Boiler Works, 328 Walnut Street, Allentown, Pa., manufacturer of boilers, tanks, etc., has been incorporated with a capital of $35,000. Charles Collum is treasurer.

The General Refractories Co., Karthaus, Pa., manufacturer of fire brick, has acquired the former plant of the Eagle Brick Works at Mill Hall, near Lock Haven. The plant is to be placed in immediate operation, and it is planned to increase the capacity by the installation of new equipment.

The stockholders of the Keystone State Fair and Industrial Exposition Co., Middletown, Pa., have voted to provide a site on the company's fair grounds for the erection of a plant for the manufacture of aeroplanes, hydroplanes, and other aircraft. It is said that the new plant will be constructed by the Keystone Industrial Corporation, Harrisburg, Pa., recently incorporated in Delaware with a capital of $1,500,000. George W. McIlhenny, 25 North Thirteenth Street, Harrisburg, is associated with the new company.

The United States Cotton Harvester Co., Wilkinsburg, Pa., has been incorporated in Delaware with a capital of $100,000 to manufacture cotton harvester machinery. J. Heck, M. E. Borger and J. K. Townsend are the incorporat

The officers of the Washington Mold, Machine & Foun Co., Washington, Pa., are: J. L. Scheli, president; W. Bromley, vice-president; C. M. Bromley, secretary; Char Bromley, treasurer, and W. M. Crile, general manager. T company was chartered in May for $25,000 and already h in operation a number of lathes, shaping, drilling and gri ing machines, a small forge and other requisites.

Baltimore

BALTIMORE, June 18.

The Bartlett-Hayward Co., Scott and McHenry street Baltimore, will build a three-story addition, 26 x 63 ft to cost $8,000.

The Southern Can Co., 717 South Wolfe Street, Baltimor will build a one-story, 21 x 24-ft. building at 1915 Aliceanna Street, at a cost of about $1,500.

The Baltimore Buggy Top Co., 107-113 West Mount Royal Avenue, Baltimore, will build a three-story factory, 75 x 152 ft.

The Federal Car Equipment Co., Marion, Va., has been incorporated in Delaware with a capital of $75,000 to manufacture railroad cars and auxiliary equipment. W. H. Teas, T. J. Maxwell, Marion, and G. H. Wilson, Chattanooga, Tenn., are the incorporators.

The Railway Safety Device & Tool Co., Dunbar, W. Va., has filed articles of incorporation at Charleston, with a capital of $600,000 to operate a local plant for the manufacture of safety appliances and tools. The incorporators are R. E. Jackson, E. G. Livesay, Princeton; J. A. Viquesney, Belington; Frank M. Glenn, Parsons, and W. H. Bardin, Beckley.

Chicago

CHICAGO, June 18.

The Chicago & Northwestern Railway has asked for estimates on a list of about 100 machine tools, embracing nearly every type of machine that goes into a railroad shop. Bids are to be submitted by June 22, Chicago delivery. Part of the list provides tools for an extension recently made to its Chicago shops. Where electric motors are involved they must be General Electric, Westinghouse or Allis-Chalmers.

The C. B. & Q. has recently placed a few orders, purchasing among other tools a slightly used planing machine in preference to waiting for a new one. Inquiries are out for two 8-ft. power squaring shears, one plain and one with gap; one rotary shear and one 8-ft. large hand brake.

It is expected that the Illinois Central, which recently issued a list for upward of 90 tools, will begin to place orders this week. The Santa Fé has been purchasing against its recent inquiries.

The Clark Equipment Co., Buchanan, Mich., has purchased a number of tools, including several medium-sized turret lathes.

Miscellaneous inquiries have been more numerous in the past week and sales have shown a change for the better. Some makes of medium-sized engine lathes are still difficult to procure. Drill presses are in active demand. Boring mill deliveries are months off with practically all makes. Large turret lathes can be had inside of two months. Planing machines cannot be had promptly. The bulk of the demand continues to be for the larger sizes of machines.

It is reported that the A. Nelson Mfg. Co., manufacturer of bolts, nuts and machine supplies, which recently purchased a site between Greenview and Southport avenues near Diversey Parkway, Chicago, will erect a one-story building.

The Armour Mechanical Co., Chicago, has been incorporated with a capital stock of $500,000 by George A. Robbins, A. Watson Armour and Frank B. Gifford.

The Rockford Union Foundry Co., Rockford, Ill., has been incorporated with a capital stock of $25,000 by W. A. Brolin, Hugo L. Olson and Shelby L. Large.

The Acme Chandelier & Mfg. Co., Chicago, has been incorporated at Springfield, Ill., with a capital stock of $10,000 by F. J. Wegg, F. P. Armbruster and H. W. Dunmore of Chicago.

The Hoskins Body Co., Chicago, has been incorporated at Springfield, Ill., with a capital stock of $10,000 by J. C. and Byron Hoskins and P. J. Grogan of Chicago.

What formerly was the Staver Wagon Works on the Rock Island tracks, Chicago, has been acquired by the Studebaker Brothers Corporation from the International Harvester Co. and is now being used as an assembling plant.

The Pheoll Mfg. Co., Chicago, screw manufacturer, has purchased property, 330 x 380 ft., at the northwest corner of Twelfth Street and Waller Avenue, on which is a one-story building containing 38,500 sq. ft. of floor space.

The Belden Mfg. Co., manufacturer of insulated wire, Chicago, has purchased a site, 229 x 576 ft., between Van Buren and Congress streets, and Kilpatrick Avenue, and the Belt Line Railroad, and will erect a one-story steel-truss building to cost about $250,000. Arthur F. Coffin, architect, 64 West Randolph Street, will receive bids about June 24. Only a part of the factory, ultimately to be built, will be constructed at this time.

Robert R. Cenek, architect, 105 South La Salle Street, Chicago, is taking bids on a one and one-half story factory, 90 x 125 ft., at Thirty-first and Robey streets, for the Uncheckable Varnish Co., to cost about $30,000.

The Crescent Rubber Corporation, Elgin, Ill., has been incorporated in Delaware with a capital of $1,500,000 to manufacture rubber products. E. R. Kelly, Elgin, and George H. Gilberts and R. Hanford, Chicago, are the incorporators.

Milwaukee

MILWAUKEE, WIS., June 18.

Conditions in the local machinery market show little change. Tool-builders continue to book a very satisfactory volume of orders, although somewhat of a lull is noted owing to uncertainties of the situation. One large machine-tool maker is quoting as near as four months' delivery on some machines while others are placed eight to nine months ahead. Business is of an unusually scattering nature and bears the earmarks of the most urgent immediate requirements. Orders are for single machines, with here and there a small lot of two or three. Shop extensions continue although the high prices of material and scarcity of labor are strongly apparent. Skilled and unskilled labor for the metal-working industry is in demand.

The Electric Light and Water Commission, Shawano, Wis., is taking sealed bids until 7.30 p. m., July 2, for a 250-kw. generator, switchboard and three motor-driven centrifugal pumps. Specifications call for one simple high pressure non-condensing, heavy duty Corliss engine suitable for direct connection to a 250-kw., 2300-volt, 60 cycle, three-phase alternating current revolving field engine type generator, and a 125-volt belted type exciter. The estimated cost of the improvements is $30,000, complete, with additional structures.

The M. J. Walsh Machinery Co., 141 Sycamore Street, Milwaukee, dealer in new and used machinery, has increased its capital stock from $25,000 to $50,000.

The Aerial Cutlery Co., Marinette, Wis., maker of pocket knives and cutlery, is contemplating the erection of additions to its plant for the manufacture of razors.

The Julius Rasmussen Co., Milwaukee, has been incorporated with a capital stock of $40,000 to take over the leather belting and supply business of Julius Rasmussen, 111 West Water Street, Milwaukee. The incorporators are Julius, Margaret and Helen Rasmussen.

Armour & Co., Chicago, will spend between $80,000 and $100,000 in the construction and equipment of a cold storage warehouse and branch plant at Ridge and Market streets, Kenosha, Wis.

The Gold Medal Camp Furniture Co., Racine, Wis., is enlarging its plant by erecting two three-story and basement additions, 76 x 102 ft., and 50 x 200 ft., brick and mill construction, and adding stories to existing buildings. It also is planned to electrify the entire plant. C. C. Gittings is president. The company received Government contracts for cots, portable houses, etc.

The Bukolt Mfg. Co., Stevens Point, Wis., maker of steel-shod protectors for automobile tires, has practically completed negotiations for the establishment of a branch factory at Portage LaPrairie, Manitoba, employing 75 skilled men and producing 200 sets of protectors daily. The capacity of the main plant in Stevens Point is being more than trebled at this time. John J. Bukolt is president and general manager.

The Superior Manifold Co., Superior, Wis., has been organized by J. G. Barnsdale to manufacture a combination intake-exhaust manifold for automobile engines. It will occupy quarters in the plant now being erected at a cost of $75,000 for the Continental Motor Truck Co., Superior, of which Mr. Barnsdale is chief engineer and general manager.

The Cluley Multiplier Co., Green Bay, Wis., manufacturing adding, subtracting and multiplying machines, has discontinued general work for the present, but is making arrangements to resume production on a large scale. In the meantime the plant is accepting outside work, being well equipped for general machine work. John C. Cluley is president and chief engineer.

The Mars Mfg. Co., Merrill, Wis., manufacturing metal sanitary furniture, probably will postpone the erection of a plant at present and contract with the Invincible Metal Furniture Co., Manitowoc, Wis., for its product. L. A. Jiranek is president.

The Gemco Mfg. Co., 742 South Pierce Street, Milwaukee, manufacturer of steel automobile bumpers, shock absorbers, jacks, lamps, etc., has awarded contracts for the erection of a three-story extension, 50 x 150 ft., to its main factory. Grant F. Discher is president.

The Boone Tire & Rubber Co., Sycamore, Ill., has awarded the general contract for the erection of the first unit of its third plant, to be located at Chippewa Falls, Wis., to the Wisconsin Construction Co. of that city. It will be of brick and concrete, 100 x 200 ft., one and two stories, and cost about $125,000, complete. The main plant is in Sycamore and a second one in Des Moines, Iowa. I. V. MacLean is president.

In addition to the building recently finished and now occupied, the Kearney & Trecker Co., Milwaukee, is breaking ground for another 50-ft. extension. It has a heavy volume of business booked for delivery throughout the year.

Cleveland

CLEVELAND, June 19.

The machine tool market, which has been quiet for several weeks, shows more life, both in sales and inquiry. A number of orders were placed last week on small lists that had been pending for some time, but which were held up because of the feeling of hesitancy among buyers growing out of the war situation. Some new demand has developed from makers of motor truck parts and there is still a fair amount of business coming from the rubber tire industry, particularly in boring mills. During the week a Cleveland machinery house took two orders, one for four and the other for six boring machines, one order coming from a Cleveland manufacturer of truck parts. With these two orders one Cleveland machinery dealer has sold 27 boring mills from 42 in. up in the past three weeks, the most of these for 1918 delivery.

The Kilby Mfg. Co., Cleveland, will enlarge its plant by the erection of a three-story pattern shop and storage building, 70 x 135 ft. A water tower of 45,000 gal. capacity and a sprinkling system will also be provided. Bids are being taken by the W. S. Ferguson Co., Cleveland.

The Standard Foundry & Mfg. Co., Cleveland, will erect a factory on Grand Avenue to cost $10,000.

The Cowles Tool Co., Cleveland, will build a new machine shop at 2087 West 110th Street.

The Buckeye Tool & Machine Co., New Philadelphia, Ohio, has been incorporated with a capital stock of $70,000 by H. H. Herold, Robert C. Finger and others.

The Clarke-Kessler Chemical Co., Wickliffe, Ohio, has been organized with a capital stock of $250,000 by H. W. Kessler, C. R. Kessler, G. W. Clarke and others to manufacture chemicals.

The Mechanics Machine & Stock Repair Co., Akron, Ohio, has been incorporated with a capital stock of $10,000 by Ralph K. Dodge and others.

The Superior Brass Mfg. Co., Mansfield, Ohio, recently organized with a capital stock of $35,000, started operations in its plant last week. This product will be mostly stove cocks and valves for gas ranges and water heaters. C. A. Frye is secretary and W. S. Valmore, general manager.

The Niles Car & Mfg. Co., Niles, Ohio, announces that it will devote its operations hereafter to the manufacture of 1, 1½ and 2 ton motor trucks exclusively.

The Geneva Metal Wheel Co., Geneva, Ohio, will enlarge its plant by the erection of a general manufacturing and storage building, 60 x 100 ft.

The Rex File Co., Newcomerstown, Ohio, has been purchased by the Heller Brothers Co., Newark, N. J. The factory was recently destroyed by fire but it is stated it will either be rebuilt on a much larger scale or the business removed to Newark.

The Lima Steel Castings Co., Lima, Ohio, has acquired a 4½-acre site adjoining its plant on which it will shortly begin the erection of a pattern storage building, 50 x 200 ft.

The Fostoria Screw Co., Fostoria, Ohio, has increased its capital stock from $100,000 to $350,000.

Indianapolis

INDIANAPOLIS, June 18.

The Nordyke & Marmon Co., Indianapolis, manufacturer of automobiles and flour milling machinery, will erect an addition to its plant, to be completed in 60 days, in which aeroplane motors for the Government will be manufactured.

The Horton Mfg. Co., Fort Wayne, Ind., maker of washing machines, will build a fireproof structure to take the place of the two buildings recently destroyed by fire with a loss estimated at $75,000.

The Kokomo Air Craft Co., Kokomo, Ind., has been incorporated with $100,000 to manufacture aeroplanes. The company will use part of the plant of the Kokomo Brass Works until it establishes a factory of its own. George Kingston is president; A. A. Charles, vice-president and secretary.

The Steelhard Mfg. Co., Kokomo, Ind., has been incorporated with $5,000 capital stock to manufacture tools and machinery. The directors are William H. Arnold, Lewis Shively and Thomas Arnold.

The Remy Brothers Co., Kokomo, Ind., has been incorporated with $500,000 capital stock to manufacture farm machinery. The directors are William J. Henley, Charles N. Elliott, J. W. Joseph, Henry Abrams and Vay Hardwicke.

The Sanitary Specialties Co., Evansville, Ind., has been incorporated with $100,000 capital stock to manufacture wood and metal devices, etc. The directors are William Scherfflus, Jr., Floyd Johnson and B. Johnson.

The Dugger Machine & Auto. Co., Evansville, Ind., has been incorporated with $10,000 capital stock to manufacture automobile parts. The directors are Oscar L. and Charles M. Dugger and Harry C. Post.

The Glover Equipment Co., Indianapolis, manufacturer of automobile tops, has increased its capital stock from $20,000 to $50,000.

The Britton Carburetor Co., Indianapolis, has been incorporated with $15,000 capital stock to manufacture carburetors and automobile accessories. The directors are Carl G. Fisher, Charles G. McCutcheon and Quintin G. Noblitt.

The Jefferson County Commissioners will receive bids July 2 for a portable gyratory stone crusher, capacity 10 to 20 tons per hour, equipped with trucks, etc. Charles S. Dibler, Madison, Ind., is auditor.

The Edwards X-Ray Mfg. Co., Indianapolis, is not manufacturing a regular line of surgical supplies, including a full line of instruments, as was reported in a recent issue. It confines itself to X-ray and high frequency coils for physicians and dentists.

The Standard Steel Car Co., Hammond, Ind., has plans for the erection of a factory, 180 x 400 ft., to cost about $20,000.

Detroit

DETROIT, June 18.

It is expected that this city will become the aeroplane center of the country, and large orders from the Government are anticipated. Many automobile factories are anticipating changing the equipment of their plants to manufacture airplanes on a large scale. Detroit, which has 41 of the largest automobile factories in the country, could readily turn out hundreds of aeroplanes a day, and the 261 accessory factories could manufacture parts to further increase the output. A successful aeroplane engine has been developed by one of the largest automobile manufacturers.

Another factor which will better the market is the proposed manufacture of tractors on an unprecedented scale. The Wayne Tractor Co., Detroit, and the Ford Motor Co. have developed practical tractors and will manufacture them on a large scale. The Leonard Tractor Co., Jackson, and the One Man Plow & Tractor Co., Ann Arbor, have been incorporated with a capital stock of $1,500,000 and $300,000 respectively.

The placing of large orders for munitions by the Government will also stimulate the machine tool market, and many metal-working factories have been holding off ordering new equipment until Governmental orders are placed.

Local shipbuilding companies are literally swamped with work, the largest reporting contracts which will keep it running at capacity for two years. Another plant has been forced to turn down orders, due to lack of skilled labor.

W. B. Stout, aircraft engineer of the Packard Motor Car Co., Detroit, states that the company has given up the idea of making planes and will turn its entire attention in this department to the manufacture of airplane engines.

The Napoleon Motor Co., Napoleon, Ohio, will locate in Traverse City, Mich., immediately. It has signed orders for nearly 5000 pleasure cars and 300 trucks.

The Muskegon Engine Co., Muskegon, Mich., maker of valveless, four-cycle engines, will soon begin the manufacture of motor trucks of 1 and 2 tons capacity. The general offices, formerly in Grand Rapids, have been removed to Muskegon, and a new factory will be erected. C. E. Johnson, Muskegon, is president; H. L. Smith, Grand Rapids, vice-president, and Harry D. Hansen, Muskegon, secretary and treasurer.

The Hamilton Motor Co., Grand Haven, Mich., will probably manufacture a light truck as well as a pleasure car. It is now receiving equipment and is preparing for active production.

The Lapeer Tractor Truck Co., Lapeer, Mich., has been organized with offices at 2058 Penobscot Building, Detroit, and a service station at 22-32 Brady Street. Benjamin W. Cutting is president; Thomas W. Payne, vice-president; M. E. Ryan, Jr., secretary and treasurer. S. B. Winn, formerly connected with the Packard and Studebaker companies, will be manager of the Detroit sales office.

The Parsons Mfg. Co., Detroit, manufacturer of automobile hardware, has moved into its new factory at Stanley and Vermont Avenue, where its capacity will be greatly increased.

The Samson Trailer Co., Grand Rapids, Mich., has purchased 10 acres of land as a factory site and will immediately begin the erection of the first unit of its plant, 80 x 160 ft., one story. The property adjoins the plant of the United Truck Co.

The Lansing Foundry Co., Lansing, Mich., has completed its new offices, and the old quarters have been taken over for production purposes.

The Superior Ore Milling Corporation, Ishpeming, Mich., has been organized to manufacture pulverizers, grinders and crushers and to operate ore reducing and concentrating plants.

The Michigan Copper & Brass Works, Detroit, will build a one-story addition to its plant on Cavalry Avenue.

The Wayne Steering Wheel & Bow Co., Wayne, Mich., is erecting a plant, 50 x 175 ft.

Cincinnati

CINCINNATI, June 18.

The scarcity of common labor is a matter of concern with all manufacturers. It is more difficult to secure than skilled mechanics and wages at present are at the top notch. The increased cost of labor and materials has forced machine-tool builders to advance selling prices, but even now they are not proportionately as high as manufacturing costs would justify.

Makers of sugar machinery in this section are very busy on orders from Cuba, Porto Rico and Louisiana, the contract season commencing much earlier than usual. Small and medium sized electric generators and motors are in excellent demand, but a great deal of complaint is heard as to slowness of deliveries. The same situation to a certain extent faces makers of portable electric drilling and grinding machines.

The demand for second-hand machine tools is not very good, but stocks are at a low ebb. The export call for machine tools has fallen off considerably, but the domestic demand from shipbuilding and auto truck manufacturers is excellent. Automobile makers are only buying for replacement purposes.

The Trimmer-Haynes Mfg. Co., Cincinnati, recently incorporated, will install a building at 424 East Eighth Street to do general machine work. Only part of the necessary equipment has been purchased.

The American Tool Works Co., Cincinnati, expects to begin moving into its new plant by July 1. Arrangements have been made to obviate any delays in the company's output of machine tools.

The Efferose Sugar Co., Cincinnati, is a new company organized to erect a sugar factory in Carthage. J. Walter Freiberg is one of the principal members of the firm. The company will manufacture sugar from grain.

The Western Water Motor Co., 2105 Central Avenue, Cincinnati, is installing a plant for the manufacture of motor washing machines. A turret lathe will be purchased later.

The Dana-Ball Co., Dayton, Ohio, has been incorporated with $10,000 capital stock by P. R. Dana, C. S. Ball and others, to manufacture ice cream dippers and hardware specialties.

The La French Power Spark Plug Company, Dayton, has been incorporated with $100,000 capital stock to manufacture

spark plugs. F. A. Eastman is one of the principal incorporators.

The new plant of the Dayton Body Company, Dayton, is rapidly nearing completion and installation of machinery will be begun at an early date.

On June 10 fire almost completely destroyed the plant of the J. C. Hearn Machine Works, Columbus, entailing a loss estimated at $80,000. Rebuilding plans have not yet been given out.

The Jeffrey Mfg. Co., Columbus, is adding equipment to its plant on Goodale Street.

The Columbus Anvil & Forging Co., and the Columbus Forge & Iron Co., Columbus, have secured large orders from the Government for anvils and forges, and are operating their plants at capacity.

The Columbus Railway, Power & Light Co., Columbus, is making an addition to its power plant on Spring Street. The necessary boilers have been purchased.

The Central South

LOUISVILLE, KY., June 18.

The machinery trade is the most active at this time, with little stirring in structural lines. Inquiries for boilers and motors are holding up and a big demand is noted for contractors' second-hand equipment.

The Wood-Mosaic Co., Louisville, and New Albany, Ind., has purchased timber lands in Allen County for $40,000 and will establish a saw mill.

The Riverside Coal Co., Jackson, Ky., is in the market for a second-hand air compressor outfit, in good condition, of about 150 hp. Emory Cain is president.

The Union Motor Car Co., Memphis, Tenn., has increased its capital stock from $40,000 to $180,000. J. T. Fisher, J. W. Gates and J. E. Holmes are interested.

The Robert R. Nixon Co., Chattanooga, Tenn., is in the market for a two-stage belt-driven air compressor of 500 to 700-cu. ft. capacity, short belt drive preferred; and for a 3-motor cage controlled traveling crane, 5 or 10-ton, span 55 ft. 6 in., for 220-volt direct-current.

M. B. Parker, 1912 Oak Street, Chattanooga, is asking for prices on a small or medium-sized steam hammer.

The Nashville Products Co., Nashville, Tenn., is asking for prices on a 100-lb. mixer, 2½ hp. motor, separator, and agitator tanks of 50, 100 and 400 gal. capacity.

The capital stock of the Hart Mfg. Co., Louisville, recently incorporated, is $60,000, and not $6,000, as was erroneously stated in THE IRON AGE of June 7.

St. Louis

ST. LOUIS, June 18.

The machine tool market continues quiet. Wood-working and metal working machinery is wanted but is not available for delivery.

The Polar Ware Ice & Fuel Co., St. Louis, will equip an ice-making and cold storage plant in East St. Louis, Ill., to cost about $100,000.

The Spring Wheel Co., St. Louis, Mo., has been incorporated in Delaware with a capital of $100,000 to manufacture wheels, etc. Robert H. Puff, John D. Puff, William O. Eisele, John L. Moon, Francis A. Tissier are the incorporators.

The Fulton Iron Works Co., St. Louis, is the new name for the business formerly conducted as the Fulton Iron Works. The name Fulton Machine Co. was adopted temporarily in order that the company could surrender its old charter while applying for a new one. This led to an erroneous announcement that the permanent name of the concern would be the Fulton Machine Co.

Morris & Co., Chicago, will equip a meat-packing and a refrigerating plant at St. Louis.

The Brandle Motors Co., St. Louis, has been incorporated with a capital stock of $50,000 by T. C. Brandle, Guy Wilson and E. L. Fruch to equip a machine shop and garage.

The electric light and power and the waterworks plants at Clinton, Mo., have been bought by Morrison & McCall, St. Louis, who will install additional machinery.

The Clinton Gin Co., Clinton, Ark., has been incorporated with a capital stock of $10,000 by Floyd Johnson, Luther Bradley and G. C. Morrow to operate a cotton gin.

The Hoxie-Walnut Ridge Compress Co., Walnut Ridge, Ark., G. E. Drewey, general manager, will install compress machinery to cost $20,000.

The Myar Co., 124 East Fourth Street, Little Rock, Ark., will equip a plant to manufacture automobile accessories. S. A. Myar is president.

The Potlach Oil Refining Co., Oklahoma City, Okla., has been incorporated with a capital stock of $500,000 by C. R. Hamilton, A. F. Wood and W. H. Graham.

The Revenue Producing Refining Co., Tulsa, Okla., has been incorporated with a capital stock of $100,000 by D. C. Bannington and others.

The Carhart Motor, Oklahoma City, Okla., has been incorporated with a capital of $500,000 by E. K. Seack, E. E. Beake and others to manufacture motor cars.

The Central Ice Water Co., Picher, Okla., is in the market for pumps and power equipment, water tower, etc.

The Truck Sales Co., Oklahoma City, Okla., is in the market for air compressors and other machinery.

The Flenwood Lumber Co., Fernwood, Miss., is in the market for an underwriters fire pump of 1500 gal. per min. capacity.

The Corinth Elevator Feed Mill, Corinth, Miss., B. F. Liddon, owner, is in the market for crude oil engines and other machinery.

The John Lindsey Lumber Co.'s plant, Laurel, Miss., has been burned with a loss on machinery of $20,000.

The Hardwood mill of the Richton Lumber Co., Richton, Miss., has been burned with $12,500 loss on machinery.

The Mississippi State Penitentiary Board will install an ice and cold storage plant at Jackson, Miss., to cost about $40,000.

The Perry Revolving Fixture Co., Meridian, Miss., has been incorporated with a capital stock of $20,000 by J. M. Perry, H. E. Flournoy, Jr., and J. R. McCorkee.

The Yazoo & Mississippi Valley Railroad, Baton Rouge, La., will equip an 8-stall roundhouse, turntable, machine shop, power house, etc., requiring about $150,000 of machinery; also a water supply system.

The mill at Barham, La., of the W. R. Pickering Lumber Co., has been burned with a loss on machinery of about $20,000.

The Wabash Refining Co., Tulsa, Okla., has acquired a tract of 60 acres in Sand Springs and will at once commence the erection of a refinery to have a capacity of 2000 bbl.

California

LOS ANGELES, June 11.

The Santa Fé Railway Co., Kerckhoff Building, Los Angeles, has awarded a contract to the Cresmer Mfg. Co., Riverside, for the erection of three new buildings at its car shops at San Bernardino to cost about $60,000. The extensions will consist of a one-story refrigerator car repair works, 46 x 1200 ft.; one-story blacksmith shop, 46 x 400 ft.; and one-story car repair shop, 46 x 400 ft. G. W. Harris is chief engineer.

The Universal Tool Co., Los Angeles has been incorporated with a capital of $25,000 to manufacture tools. Robert B. Ferguson, H. M. Douglas, H. F. and D. R. Gardner, and W. A. Wright are the incorporators.

The Crellin Machine Co., 121 West Railroad Street, Los Angeles, manufacturer of dies and tools, will build a new one-story brick machine shop, about 30 x 100 ft., on Railroad Street, near Main.

The Moreland Motor Truck Co., 1701 North Main Street, Los Angeles, manufacturer of motor trucks, will build a one-story shop addition, about 50 x 134 ft.

The Whiting-Keese Cultimotor Co., Los Angeles, has been incorporated with a capital of $25,000 to manufacture cultivating equipment. George N. and Dwight Whiting, and Richard A. Keese are the incorporators.

The Pacific Glass Casket Company, 416 Merritt Building, Los Angeles, has acquired a site at Santa Monica for the erection of a plant to manufacture glass jars and food containers. The initial works will cost about $50,000. W. L. Desnoyers is president.

Cox & Peterson, San Diego, Cal., have filed plans for the erection of a one-story machine shop addition at the foot of Market Street.

The Marine Products Co., Los Angeles, has been incorporated with a capital of $25,000 to operate a local plant for the manufacture of marine specialties. G. A. Constantine and James Gataon are the incorporators.

The San Joaquin Valley Sugar Co., Visalia, Cal., is planning for the erection of new sugar works near Bakersfield, with a daily capacity of about 1000 tons. The proposed buildings and machinery are estimated to cost $800,000. E. A. Nickerson is president; James Pingree is vice-president.

The Pacific Northwest

PORTLAND, ORE., June 12.

The letting of Government contracts for lumber in Oregon and Washington for shipbuilding and cantonments has put all the mills and logging camps in this section to work. Wooden shipbuilding is going on at capacity, with new yards being announced almost daily. Outside of shipbuilding and the industries dependent on that and other Government work, there is something of a lull in the demand for machinery and machine tools. Many orders are still to be filed, but new ones are coming in more slowly. The call for compressors, hoists and other mining equipment, however, has long ago outstripped the supply. Farming machinery is becoming scarce and orders are now booked for several months ahead.

The Pacific Shipbuilding Co., Seattle, Wash., has bought 8 acres of land near the mouth of the Duwamish River, with a water frontage of 956 ft., and will immediately construct a yard for building wooden ships. The first keel is to be laid within 60 days.

The Paterson-MacDonald Co., Seattle, Wash., has bought 25 acres of water front land and will construct a shipbuilding plant for wood and steel vessels. About $250,000 will be spent at once in equipping the unit for wooden vessels. The unit for building steel vessels will be erected as soon as materials and equipment can be secured.

Charles F. Swigert, president Pacific Bridge Co., Portland, who is now in the East, is understood to have arranged with the Foundation Co., New York, for the erection and equipment of a wooden shipbuilding plant at Portland to build 50 wooden vessels for the French Government.

The Stewart Shipbuilding Co., Seattle, has been incorporated with a capital stock of $100,000 by H. D. and R. S. Stewart.

George W. Smith, Bellingham, Wash., reports contracts aggregating $300,000 for parts for wooden ships. Special machinery will be installed for turning out these orders.

A. J. Drews, Gardiner, Ore., has let a contract for the construction of a new machine shop, 40 x 100 ft. A foundry and blacksmith shop will be added.

The Heese-Martin Iron Works, Portland, has increased its capital stock to $135,000.

The St. Helens Shipbuilding Co., Portland, has increased its capital stock to $250,000.

The Pacific Marine Iron Works, Portland, has been organized with a capital stock of $125,000 to manufacture marine engines, etc. Fred A. Ballin of the Ballin Watertube Boiler Co., heads the new company.

The Henricks Mfg Co., Seattle, has let contract for a machine shop, 100 x 128 ft., to cost about $10,000. The equipment will include a large traveling crane.

The board of directors of School District No. 1, Seattle, is advertising for bids for malleable and cast iron fittings and other supplies for the shop department.

The Cascade Paper Co., Tacoma, Wash., has been organized to erect a plant on Chamber's Creek, where a 30-acre site has been secured. It is announced that the capital stock will be $400,000. Frank S. Baker is at the head of the company.

The Alaska-Pacific Construction Co., Portland, has been incorporated by C. A. Burckhardt, John H. Burgard and L. A. McNary. It will build a 4000-ton wooden ship.

The Marine Pipe & Machine Works, 579 Railroad Avenue, Seattle, has had plans completed for the construction of a two-story building, 100 x 152 ft., at the foot of Spokane Avenue, to cost $15,000.

The Pacific Scale & Show Case Co., Spokane, has sold its plant to C. J. Reed of that city, who plans to enlarge it.

James A. Malacove, Tacoma, Wash., plans to establish a factory in the vicinity of Tacoma for the manufacture of a combined plowing and planting machine and power tractor cultivator.

The Keystone Type Foundry, Philadelphia, Pa., will establish a branch in the Blake-McFall Building, Portland, under the management of John I. Caldwell.

The Elliott Bay Shipbuilding Co., Seattle, is having plans prepared for shipyards on the West Waterway, to cost more than $100,000 and to have five ways, each 72 x 300 ft., 80 ft. high. The buildings include a two-story band mill, 50 x 180 ft.; joiner shops and mold loft; tool room, 28 x 122 ft.; paint shed, 22 x 38 ft.; warehouse, 30 x 120 ft.; machine shop, 60 x 118 ft.; foundry, 50 x 120 ft., and three buildings each 28 x 50 ft., to house air compressors, blacksmith shop, etc.

The Peninsular Shipbuilding Co., Portland, will erect a plate shop, new mold loft, etc., to provide for the construction of 8 additional wooden steamers.

Gresham, Ore., will construct a municipal power plant to cost $125,000. Work will be started this summer.

Charles W. Jones, Portland, is at the head of a syndicate that plans to establish a fertilizer plant on the property of Oregon-Portland Cement Co., near Roseburg, Ore., to cost $125,000.

The Erickson Shipbuilding Co., Seattle, has received a contract amounting to approximately $8,000,000. It will establish a plant at once, and 8000-ton vessels are to be turned out in 18 months.

Canada

TORONTO, June 18, 1917.

W. Casper, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Constance P. Adair, George F. Rooney, Florence A. Sweet and others to manufacture jewelry, chains, watches, clocks, etc.

Ker Woodturning, Ltd., Toronto, has been incorporated with a capital stock of $40,000 to manufacture desks, furniture, products in which wood is used, etc., by George H. Harper, Thomas Ker, William J. McWaters and others.

The Beaverton Toy Co., Ltd., Beaverton, Ont., has been incorporated with a capital stock of $40,000 by Benjamin Madill, Morris Shapiro, Ahia Cooperman and others to manufacture metal and wooden toys, etc.

Ford, Ont., granted tax exemptions to the Chalmers Motor Car Co., which will build a factory, estimated to cost $350,000, to replace the one recently destroyed by fire.

The Halifax Shipbuilding Co., Ltd., Halifax, N. S., has been incorporated with a capital stock of $3,000,000 by Joseph B. Kenny, Richard N. Tyler, Hector D. Kemp and others to build shipyards, drydocks, ships, machinery, etc.

The Fabri-Cord Tire Co. of Canada, Ltd., has been incorporated with a capital stock of $1,500,000 by Arthur L. Reid, Kenneth D. Mackenzie, Archibald M. Borthwick and others to manufacture rubber tires, etc.

The Foundation Co. of British Columbia, Ltd., a subsidiary of the Foundation Co., Ltd., Montreal, has been formed, and a shipyard will be built at Victoria, B. C. It has received an order through the Imperial Munitions Board, Ottawa, for 10 wooden vessels of 3500 tons each. R. L. Dalton, Montreal, is treasurer, and W. I. Bishop, also of Montreal, will be superintendent of construction. Mr. Dalton has left for Victoria.

Strathroy, Ont., will receive bids until July 1 for improvements to its waterworks plant to cost $10,000. Kerry & Chace, Confederation Life Building, Toronto, are the engineers.

The Can't Sag Gate Co., Alvinston, Ont., will build an addition to its plant to cost $10,000. W. J. Reader is manager.

The Procter & Gamble Co., Hamilton, soap manufacturers, will build a brick addition to its plant to cost $25,000.

The L'Air Liquid Society, Montreal, has secured a site at Halifax, N. S., and will establish a plant, 50 x 100 ft., for the manufacture of acetylene cutting and welding machines, etc. Charles Royer is general manager.

The Universal Reinforced Tire Co., Ltd., Montreal, has been incorporated with a capital stock of $20,000 by V. Levesque, J. O. Richard, C. Gravel and others to manufacture automobile tires, rubber goods, etc.

The Cameron Lumber Co.'s mills, near Selkirk Water, B. C., together with the larger part of the machine shop, were destroyed by fire with a loss of $100,000.

Weir & Weir, St. Mary's, Ont., are in the market for a 30 to 35 hp. gasoline engine, with all parts complete, for delivery about July 1.

The H. Muller Mfg. Co., Sarnia, Ont., has completed plans for the erection of a brass rolling mill. Construction work will be started in a few days.

Montreal capitalists, including William Lyall, president P. Lyall & Sons Construction Co.; H. W. Beauclerc and others, have acquired the wooden shipbuilding branch of the Wallace Shipbuilding Co., Vancouver, B. C., and will organize a company with a Dominion charter. Contracts have been closed with the Imperial Munitions Board for several vessels of the standardized 3000-ton type, now being constructed on the coast, to be equipped with auxiliary Diesel engines. The vessels will cost approximately $400,000 each and the company expects to turn out at least 10 this year. The property purchased from the Wallace Company includes three shipbuilding ways, and three more will be constructed.

The Goderich Dry Dock & Shipbuilding Co., Goderich, Ont., will erect shipyards for building steel ships and is in the market for equipment, including plate machinery and trolley cranes.

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